Developing Interprofessional Competence
Theoretical and Empirical Contributions

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Denna skrift tillågnas anställda och studenter vid Hälsouniversitetet i Linköping och personer som är intresserade av interprofessionell utbildning!

Författaren

Att möta en person som arbetar professionellt i vården är fantastiskt – men att möta det interprofessionella teamet som samarbetar för bästa möjliga vård måste vara oslagbart!
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PAPER I-V
\textbf{ABSTRACT}

\textbf{Background:} Different professions meet and work together in teams every day in health and social care. In order to identify and deliver the best quality of care for the patient, the teamworkers need to be both professionally and interprofessionally competent. How can higher education prepare teamworkers to be both professionally and interprofessionally competent? This thesis seeks to contribute theoretically and empirically to this issue. A starting point for interprofessional education (IPE) worldwide was when WHO presented a document entitled “Learning Together to Work Together for Better Health”. The basic idea in this strategy was that it is favourable for undergraduate students and the development of their own professional identity to experience other professions in health and social sectors as early as during their undergraduate studies. Inherent in this scheme is that the various professions will work together in practice. The overall winner in this new thinking about education and professional practice would be the patient. One of the first systematic attempts to organize IPE academically was initiated in 1986 at the Faculty of Health Sciences (FHS) at Linköping University in Sweden. The “Linköping Model” has now yielded 25 years of practical experience and development of IPE curricula.

\textbf{Aims:} The overall aims of this thesis were to define, describe and measure effects and outcomes of interprofessional education/learning.

\textbf{Methods:} In the research papers theoretical, qualitative and quantitative methods have been used.

\textbf{Results:} The newly registered medical doctors educated at the FHS at Linköping University and exposed to IPE and PBL reported more confidence ($p < 0.0001$) that their undergraduate studies had given them interprofessional skills and abilities to collaborate with other professions than medical students from all other medical faculties in Sweden. Nurses who had been exposed to interprofessional curricula during their undergraduate education at FHS reported to a greater extent ($p = 0.003$) that they were prepared to work as a nurse. Furthermore, they also reported to a greater extent ($p < 0.0001$) that their undergraduate education had prepared them to work with other health care professions. Other findings in this thesis were that female students in general and nursing students had a more positive view of interprofessional learning and were more open-minded about collaboration with other professions. Only to a minor extent did exposure to a more extensive interprofessional curriculum promote a positive attitude towards teamwork.

\textbf{Conclusions:} A major challenge to modern health care is the need for more interprofessional teamwork to improve the safety and quality of patient-centred care. This thesis indicates some directions for more successful interprofessional education.
LIST OF PAPERS


ABBREVIATIONS

CAIPE Centrum for Advancement of Interprofessional Education

FHS Faculty of Health Sciences

IP Interprofessional

HEL I Health Ethics and Learning part I

HEL II Health Ethics and Learning part II

IPE Interprofessional Education

IPL Interprofessional Learning

IPT Interprofessional Team

IPTW Interprofessional Training Ward

PBL Problem-Based Learning

RIPLS Readiness for Interprofessional Learning Scale

WHA World Health Assembly

WHO World Health Organization
1. INTRODUCTION

Different professions meet and work together in teams every day in health and social care. To accomplish this teamwork, one not only needs to be professionally competent, but also interprofessionally competent, to identify and deliver the best quality of care for the patient. How can higher education prepare teamworkers to be both professionally and interprofessionally competent? In this thesis I seek to contribute to the discussion about these issues.

1.1 WHO documents about IPE

The World Health Organization (WHO), 1988, presented a strategy interprofessional education (IPE) document entitled “Learning Together to Work Together for Better Health”, inspired by the Alma-Ata Declaration (WHO, 1978). This document was the starting point for IPE worldwide (WHO, 1988). The basic idea was that it is favourable for undergraduate students and the development of their own professional identity to experience other professions in the health and social sectors already under their undergraduate studies. Inherent in this scheme is that the various professions will work together in practice. The WHO document encouraged the development of IPE activities around the world to promote effective teamwork in health care. It also described how to find solutions to health problems caused by society and the environment in the future. The overall winner in this new thinking about education and professional practice would be the patient.

In 2007 WHO again put IPE on the agenda by calling for a “Study Group on Interprofessional Education and Collaborative Practice” in order to prepare a technical report highlighted by the World Health Report 2006; Working Together for Health. The report was finalized 2010. Topics in the report were the urgency for action to enhance human
resources for health internationally and revealed an estimated worldwide shortage of almost 4.3 million doctors, midwives and nurses. The 59th World Health Assembly (WHA) recognizes this crisis and adopted a resolution (WHA.59.23) calling for a rapid scaling-up of health workforce production through various strategies: for example, the use of innovative approaches to teaching in industrialized and developing countries World Health Assembly. WHO has once more come to recognize the importance of interprofessional education and collaborative practice as one of the innovative approaches that could also help tackle the global health workforce challenge?

1.2 Factors of importance for IPE initiatives

There are several important factors which today merit renewed attention, further research and possible interventions of interprofessional education and practice. Nations in the 21st century are increasingly becoming more multiethnic and multicultural, with a high degree of mobility and ageing populations. Europe, for instance, has the highest portion of old people in the world (Ferring et al., 2004). These trends carry implications for the organization, delivery and cost of health and social care, thereby putting practicing professionals under increasing pressure to respond to more complex problems. This requires interprofessional competence to respond effectively and to realize the ideals of holistic care and treatment. Taking a holistic approach to the patient necessitates the use of such tools as problem solving and critical thinking. This means that professions in health and social care need to define new roles and create new cultural patterns to ensure patient/client-centred care and strengthen the clinical pathway. Collaboration between professions is especially important in rural and remote areas where the available health care resources are often relatively scarcer than in urban areas (Faresjö, 2006).

A general trend in health care worldwide is a transition from hospital care to primary care due to a growing understanding of the value of prevention. Apart from this, rising health care costs, advances in medical technology and changes in demography contribute to the fact that the
local community is now the locus of care for an increasing number of patients and users. Bridging health and social care as well as community and hospital care is critical. Success depends on the motivation and competence of health professionals to establish collaborative practices (McNair et al., 2005).

In the post-industrial society the individual is exposed to a never-ending explosion of knowledge which is easily accessible, not least advice about health and health-promoting behaviour. The individual as a consumer not only of goods, but also of knowledge, is better informed, more demanding and sometimes more critical. This demands closer collaboration between professions to measure up to rising expectations (Gröne et al., 2001).

The explosion of knowledge also influences traditional professional boundaries. Emerging new specialties within professions and fields of collaboration between professions challenge old structures and behaviours. Also, evidence-based health care deals with professional problems but allows answers that do not consider borders between professions (Nancarrow et al., 2005).

Rising expectations with finite resources and sometimes shrinking staffing in health care organizations exacerbate stress, calling for new ways of working together to set limits on the demands made on any profession in order to spread the load and build in mutual support (Hertting, 2003). Jones et al., 2011 report that good teamwork reduced sickness.

Today’s students are educated to work for the coming 20–40 years and are expected to be skilful and professional in their own disciplines and fields. However, modern health care organizations also recognize the importance of interprofessional competence, which could be viewed as an additional aspect of the professional compass. Being professional today and tomorrow includes having interprofessional competence, which could be defined as the ability to collaborate with other professions, to know and understand the importance, functions and roles
of other professional groups in the field of health and social care. In defining and assessing professional competence today, interprofessional skills and lifelong learning have been found to be two important prerequisites (Epstein et al., 2002).

Countries that are known to be the most advanced in training students in IPE are the United Kingdom, Canada, Australia, the Nordic countries and Japan. However, only a few universities in these countries have IPE activities that are integrated at several levels of their curricula. More thorough IPE curricula have been implemented at the University of the West of England, Bristol, United Kingdom (Pollard et al., 2008), the University of British Columbia, Vancouver, Canada (Grant, 2010) and at Linköping University, Sweden (Areskog, 2009; Wilhelmsen et al., 2009). These universities have introduced IPE curricula that span their entire educational programs. In Australia and Canada, IPE activities are often included in educational activities located in rural areas (Lee et al., 2009, Faresjö, 2006). By comparison, in the Nordic countries there are several examples where students participate in IPE activities on a hospital ward, often called an interprofessional training ward (IPTW) during the latter part of their training (Fallsberg et al., 1999; Fallsberg et al., 2000; Wahlström et al., 1996; Wahlström et al., 1998; Hylin et al., 2007; Ponzér et al.; 2004; Jacobsen el al., 2009). As a rule, IPE is supplied in a course/module for a few days or a couple of weeks during their training and participation by the students in these activities is often voluntary, two examples are Lewitt et al., 2010, and Andersson et al., 2009.

1.3 Who is the winner in interprofessional education?

1.3.1 The patient as a winner in IPE

Initiatives for including IPE in the curricula can now be seen at many universities worldwide, not least in the United Kingdom, Canada, Australia and the Nordic countries. An early initiative of this kind was the Faculty of Health Sciences (FHS) at Linköping University in Sweden. Since 1986 this faculty has allocated up to 12 weeks of the curricula to
interprofessional education between programmes (Areskog, 1988; Areskog, 2009; Wilhelmsson et al., 2009). Based on 25 years’ experiences and the evaluations of IPE done at the FHS of Linköping University (Bredäng, 1991; Fallsberg et al, 1999; Fallsberg et al., 2000; Faresjö et al., 2007), we believe that the overall winner of IPE is the patient. The more complex and multifactorial patient needs in a multi-ethnical society calls for a more holistic patient view and interprofessional collaboration to meet these needs. Recent years the quality and safety in health care has also comes into focus (Batalden et al., 1993; Batalden, 1998; Barry et al., 2009). The patient’s needs and the quality and safety of care must be the main target of all IPE.

1.3.2 The student as a winner in IPE

The student exposed to IPE must also be regarded as a winner. He/she has learned about other professions’ knowledge base and skills and is able to look at their own profession to find its core values (the unique/special knowledge of one’s own profession). One effect of this might be that the students are more aware of the role of their own profession in complex patient/client diseases/situations and thereby understand other professions’ specialist skills. Students, who have learned together and, in many respects, developed a common language and knowledge platform will also work against negative stereotypes of other professions. The students gain interprofessional competence, which is a necessity for collaboration in health and social care practice.

1.3.3 Society as a winner in IPE

The health care system, the social services and society in general will be a winner due to IPE at our university faculties. Interprofessional collaboration will yield a shift from solely a professional focus to a user focus (patient/client-centred). This will lead to a more individualized and flexible care focusing on quality in the meeting between the patient/client and the professions. The growing proportion of elderly persons in many societies with complex diseases will require collaboration between
different professions to identify the central problem and the best care/treatment using a holistic approach. Working together well in IP teams in health and social care will increase quality and also cut costs to society (Headrick et al., 1998). Interprofessional competence, patient/client-centred care and new professional roles will strengthen the clinical pathways and thereby decrease the costs in health and social care organizations.
2. IPE AT THE FACULTY OF HEALTH SCIENCES

2.1 How it all started in Linköping

One of the first systematic attempts to organize IPE academically was initiated in 1986 at the Faculty of Health Sciences at Linköping University in Sweden. The “Linköping Model” has now yielded over 25 years of practical experience and development of IPE curricula.

Before 1986, medical students at Linköping University spent their first two years of preclinical training at the University of Uppsala and the last three and a half years in Linköping, following a conventional medical curriculum. A prospect from the government to shut down the Uppsala–Linköping collaboration in medical education started a process of re-evaluation of the education of health and social care professionals in Linköping.

In order to start a complete and also innovative medical education programme in Linköping, the university and the county council cooperated in creating a common organization and education/training for the different health education programmes (LIV Commission 1981, Areskog, 1992). The leader of the committee, Professor Areskog, who also was a representative of the World Health Organization inspired the committee to achieve the target of “Health for all by the year 2000” (WHO, 1988) set out in the Alma-Ata Declaration (WHO, 1978). In this document WHO emphasized the need for learning together in order to work together for health purposes, especially in primary health care. One of the fundamental principles in the committee work was that the whole faculty should participate in the developments.
The proposal by the committee was separated into four parts and was derived from an analysis of plausible “trends in the future Swedish society”.

1. Changes in public health services:
   - The new society and “the new critical generation” require new models in health and social care and education through new pedagogical models
   - Increasing individual autonomy and respect for the patient
   - Increasing the awareness of evidence-based medicine

2. New working models in health and social care:
   - Respect for the knowledge and skills of all professionals
   - Team training together with other health science programs

3. Changes in the national health and social care policy:
   - Greater emphasis on health prevention
   - Improved accessibility of the health and social care system by building a regionally well distributed primary health care system all over the country
   - Clarifying the different roles between hospital care and primary care

4. Meeting the demands for a new educational policy in health and social care from “the new generation”:
   - Emphasis on learning in contrast to teaching
   - Student-centred learning
   - Relevance of the knowledge and curricula content to the profession
   - Life-long learning
   - Students’ own responsibility for their learning
   - Learning should be deeply rooted internationally
The main strategies for the educational programmes at the faculty were:

“Proble-based learning, multiprofessional education and multiprofessional* research in order to create flexibility and the ability to adapt to future change within society and occupational roles. In this way new thinking, new roles and competences, new responsibilities and areas of interest will be developed in the delivery of health care. (Areskog, 1994, p 280)

*The term “multiprofessional” was at this time used synonymously to the concept interprofessional.

In order to achieve these goals, early patient contact, training of communication skills, integration of preclinical and clinical subjects, a scientific approach and critical thinking were the cornerstones in the establishment of the new curriculum at the FHS in Linköping.

2.2 Implementation of the Linköping IPE model

Interprofessional education together with problem-based learning (PBL) was introduced during the first ten weeks in a programme-integrated module, “Man - Society”, for all health science programmes. The aims of the common initial study period were to introduce problem-based learning and a scientific approach, critical thinking and ways of working, studies on life-style factors influencing health, studies on human and social relationships, training in teamwork and development of a common frame of reference. This will also lead to a common value basis including central concepts and the establishment of a common professional language that will smooth the progress of communication. The module was dominated by content and subjects from the field of behavioural and social sciences. Its aim was to study the reactions to health and illness as related to age, gender, culture, lifestyle and life events. After the introductory module the students entered their specific programmes, but participated intermittently in interprofessional sessions and seminars (Areskog, 1994; Areskog, 1995; Bergdahl et al., 1991; Bergdahl et al., 1994).
2.3 Clinical team training

After almost 10 years another innovative step in the developing of the IPE curricula was initiated by the launching of the first IPE student-training ward in the world (Wahlström et al. 1996; Wahlström et al., 1997; Wahlström et al., 1998) based on earlier experiences of clinical team training in hospitals and primary care (Johannesson, 1999). Students from medical, nursing, social care, biomedical science, physiotherapy and occupational therapy programmes in their last semester were given the responsibility to run an ordinary ward with authentic patients during a two-week placement at an orthopaedic clinic at the University Hospital of Linköping. On the ward, students collaborate, regardless of their professional alignment, to satisfy primary needs of the patient such as personal hygiene, rest, food, drink etc. Specific medical and nursing care and rehabilitation were responsibilities for the respective professions. The student-team assumed the overall responsibility for patient care and treatment with the support of supervisors. The ward gives the students opportunities to develop and exercise their own professional role and gives insight into the skills of other professions while taking responsibility for the patients’ needs. Two orthopaedic wards and one geriatric ward constitute the final IPE stage at the FHS in Linköping today. The student training wards in Linköping have been a role model for the development of comparable student wards in Sweden and internationally.

2.4 Redesigning the IPE curriculum

After about ten years the IPE curriculum was redesigned, partly by launching the interprofessional student training wards and partly by a revision of the first introductory module in 2000. It started with an organizational development phase, with new faculty leadership. The new leaders wanted to develop and modernize the faculty, and the module “Man-Society” was regarded as being too indistinct in certain aspects. Since the IPE curriculum is part of all programmes and its development must involve the whole faculty, a group of stakeholders and
representatives from the programmes and students’ union started a joint process of renewal of the first IPE module. The assumption that gaining interprofessional competence is a process over time and a focus on public health and epidemiology were starting points for the group. The series of student evaluations and the vast experience and knowledge accumulated in the group of tutors were resources in the process.

2.5 The IPE curriculum – Part I

The theme chosen for the new revised IPE module was Health, Ethics and Learning. The first IPE module was condensed to eight weeks, with the intention to start a new 2-week IPE module later in the curriculum. The module “Health, Ethics and Learning, Part I (HEL I)” was aimed at defining the three central themes (Figure 1) in order to establish a platform of knowledge and a common language, as well as of critical thinking. Problem-based learning was also introduced in interprofessional tutorial groups. This gave students many opportunities to develop personal relations across the programme boarders and to practice interpersonal communication.

The aims of the first step, HEL I, was to establish a base of common values and competences. Although at this early stage the students have not yet established any professional skills, the module is intended to be a platform and common value base which facilitates interprofessional learning. Understanding the multifactor concept of health, problem-solving in groups and analyses of ethical dilemmas on individual, group and societal levels are examples of learning issues in the course. It also includes interpersonal meetings in PBL groups of 7–8 students, at least 2 hours twice a week, which are systematically evaluated from several perspectives by the participants and their tutor. Organization of the work in the group, problem-solving, productivity, dealing with conflict, individual and collective contributions, needs for improvement are examples of items that may be addressed in the evaluation part of the PBL sessions.
In the first module, HEL I, students are given such tools as problem-solving, working in small groups and self-directed learning, developing knowledge and language together to build a common value base (Figure 3). In the first year the students have an unsettled professional identity (Harden, 1998) based on prejudices and assumptions and are faced with the task of investigating sets of professional values. By discussing professional culture in the small groups, the students start a process to become aware of attitudes and roles in today’s health and social care systems.
2.6 The IPE curriculum – Part II

After the revision of the first introductory module, a new 2-week IPE module was started in 2003, “Health, Ethics and Learning, Part 2” (HEL II). During the 4th or 5th semester, students from all programmes again participate in an integrated module with a specific theme. The theme chosen then was sexology. Sexuality was not treated as a prominent part of well-being and quality of life within the undergraduate health science programmes, in spite of the fact that it is regarded as an important aspect of a holistic view of human beings. In professional practice it is seldom addressed, but if so, it is rather referred to specialists in specific cases. “Human sexuality” cuts across all programmes and possesses many aspects of health, ethics and learning (Figure 2). It also appeals to the interest, experiences and opinions of many students.

The aims of the second module, HEL II, were to gain complementary professional competences and thereby test and consolidate the students’ professional identity as a prerequisite to work in interprofessional settings. In the course, the same problems are processed from different professional perspectives in tutorial groups. Every student also presents a role-play to illustrate a realistic professional situation in which sexuality is involved. A concluding written assignment specifically addresses reflection on professional and interprofessional competence in relation to the subject sexology.

When entering HEL II the students have acquired knowledge and quite established patterns of professional performance from their “own” profession to add to the common tools and knowledge from HEL I (Harden, 1998). The IPE small group is now able to solve problems with contributions from different professional perspectives, thus learning both with and from one another.
2.7 The IPE curriculum - Part III

The third module of the Linköping IPE model is a 2-week placement on an interprofessional student training ward late in the educational programme. The purpose is to test and establish collaborative and interprofessional competences in a realistic milieu. The students present themselves and are regarded as professionals in the team, although under highly skilled supervision. In the student training ward during the last semester, the FHS students make use of their skills, theoretical knowledge and practical experiences, so as to test their applicability. At this stage the students are professional and more capable of learning with, from and about each other (Harden, 1998). They work in teams as professionals with well developed interprofessional skills and
acknowledging different professional, organizational and disciplinary views.

Other opportunities for interprofessional student training and practice are found in the local community and primary care in addition to competency training at skills labs at the University Hospital. Small-scale modules are organized within the scope of the different programmes. Collaboration between occupational therapy and civil engineering programmes is one example where students from the two programmes work together to design technical aids for the functionally disabled.

2.8 Further development of the IPE curricula

All educational curricula must continuously be renewed and developed to reflect and keep up to changes in the surrounding society. Recent years the importance of “Improvement of Quality and Safety in Health care”, has been more recognised in health care (Batalden et al., 1993, Batalden, 1998). In the context of quality improvement initiatives interprofessional education could be used as a mechanism to enhance the development of practice and improvement of services (Hammick et al., 2007).

The basic assumption in quality improvement strategy is that there is a gap between “what we know and what we do” i.e. a gap between biomedical and health science knowledge and everyday clinical practice which could lead to malpractice and ineffective care (Berwick, 1996; Batalden et al., 2007). The general aim of quality improvement is to make changes and improvements in health care that should lead to better results and health of the patients, better health care systems and better professional development (Batalden et al., 2007). Interprofessional collaboration, life-long learning and improving communication skills between health care professions are fundamental to keep up high quality and safety in health care (Higgs et al., 2004; Hofseth Almås, 2007). Recent years the FHS has decided to incorporate improvements of quality and safety in health care within the established infrastructure of
interprofessional education. Learning modules of improvement of quality and safety has been designed to be incorporated within Health, Ethics and Learning Part 1 and Part 2 and also as special activities at the IPTW. In the introductory interprofessional module, the student’s perform a personal quality improvement project to identify possible need for personal improvements in their everyday life (like more frequent exercise, better nutritional habits). By this training the students practice the methodology to perform changes and to measure and evaluate them. In the second IPE module, the Health, Ethics and Learning Part 2, with the subject sexology has from spring 2011 completely been altered to solely be directed towards quality improvement in healthcare. This new 2+1 week module is organized in close collaboration between the Faculty of Health Sciences and the County Council. Hospital clinics and primary health care centres suggest improvement projects for the interprofessional students groups. Thereafter the student groups initiate changes to be made and follow and evaluate these primarily in the clinical microsystems. The concept of the clinical microsystem (Merton, 1968) the implication of outcome variation, of psychology, and a way of building knowledge through experiential learning (Kolb, 1984) offer a generative platform for further development of the scholarship of improvement. The extensive of the improvement projects could vary between clinics and could be a relay race over several semesters for several student groups. Some examples of improvement projects are accessibility to acute care, routines regarding the discharge process at a surgery ward, and hygiene aspects in primary health care. In the third IPE module, which is the 2 weeks clinical practice at the hospital training ward, quality improvement has also been implemented. Here the students in their interprofessional teams can for example make everyday observations on daily routines (for example infection risks, the frequency of constipation after surgery etc). The setting as a team-relay makes everybody aware and involved in the processes to achieve the best result to each patient. The implementation of quality improvement within the IPE curricula seems so far to be very appropriate and an important development of IPE.
But there are other challenges for the IPE curricula’s in the future. Most of our western societies are now multi-ethnic and the health care demands of its more elderly population are more complex with multifactorial diseases. Besides these rapid demographic and epidemiological transitions the health care system are facing financial problems and lack of resources and even new infections, environmental and behavioural risks (Frenk et al., 2010). To meet these demands the health and social care personal must work interprofessional and this would also be a challenge for the forthcoming IPE curricula’s.
3. CENTRAL CONCEPTS

In this chapter I will try to describe or define the central concept and discuss in some detail how the concept can be used. I have chosen the concept from central concepts in the studies included in this thesis. As there are few crystal-clear concepts, I have chosen those I found to fit the studies best.

3.1 IPE

Interprofessional education is widely perceived as a potentially effective method for enhancing collaborative practices. IPE has also been advocated not only as a means for improving collaborative practice and services, but also for changes in the workforce strategies for ultimately better health in the population. A widely adopted definition of IPE is that of the Centre for Advancement of Interprofessional Education (CAIPE) from 2002:

“Interprofessional education occurs when two or more professions learn with, from and about each other to improve collaboration and the quality of care” (CAIPE, 2002).

3.2 PBL and IPE

Problem-based learning and interprofessional education must be seen as a happy marriage since these two actually seem to support each other (Areskog, 2009; Dahlgren, 2009; Wilhelmsson et al., 2009). The problem-solving process in PBL, including reflection, analysis, critical thinking and evaluation, has to be regarded as fundamental metacognitive tools in successful IP teamwork. In problem-based learning the students work in small groups practicing and studying group processes, which are a key factor for successful teamwork (Mann et al., 2009). Discussions about the roles of different professions early on in the education/training are also
helpful, as well as discussions on stereotypes and attribution thinking. A third process in PBL is self-directed learning, which can be developed by thinking about one’s own thinking and thereby enhancing metacognitive skills, self-directed learning and also training in documentation and reflection (Williams, 2001). Evaluation is also a part of PBL, training the students to evaluate teamwork and their own and other team members’ work.

From a learning perspective, Dahlgren, 2009 has made a comparison between PBL and interprofessonal learning. First suggesting that in PBL, students share ownership of a learning task, while in IPL they share the focus on the patient. Secondly, in PBL students learn in authentic contexts by different case scenarios, while in IPL the focus is on clinical settings. In the small group in PBL, one is learning through interaction and the students in IPE curricula are negotiating a common basis for acting. The third comparison comprises evaluation: in PBL reflection on learning experiences is central, whereas in IPL evaluating the quality of care is important.

A potential benefit of IPE is the ability to decentre from one’s own professional role and to understand one’s own profession in a richer and more nuanced way. The concept of decentration is borrowed from the Swiss psychologist Jean Piaget, 1954, who made the observation children at a certain age lack the ability to observe and understand the world from a perspective other than their own. The same shortcoming may also characterize adults’ difficulties in working life when decentring their thinking from their own roles and positions (Dahlgren, 2009).

Interprofessional collaboration will yield a shift from a solely professional focus to a user and patient focus. This will lead to a more individualized and flexible care focusing on quality in the meeting between the patient and the professions. The growing proportion of elderly individuals with complex diseases in many societies will require collaboration between different professions to identify the central problem and the best care/treatment using a holistic approach.
Working together well in interprofessional teams in health care will increase quality and also cut costs to society (Headrick et al., 1998). Interprofessional competence, patient-centred care and new professional roles will strengthen the clinical pathways and thereby decrease the costs in health and social care organizations. Health care and the society in general will also be a winner because of IPE. But the overall and major winner in IPE is the patient/client. The patient’s needs and the quality and safety of care must be the main target for all interprofessional education.

3.3 The IPE learning process

Interprofessional learning is a process over time that subsequently requires several learning opportunities to establish the skills required to work together interprofessionally in practice (Figure 3). I believe that defined program-integrated modules early on in the curriculum, combined with the training ward placement as the final module, are an encouraging example of how to implement undergraduate IPE and to gain interprofessional competence among health science students. The process is strengthened by PBL in small groups and student-centred learning. The everyday routine of consciously reflecting on personal interaction and team performance gives opportunities to train the interpersonal skills fundamental to the “interprofessional professional”.

IPE is only the beginning of getting interprofessional in practice, training interprofessional competence or collaborative competence (Barr et al., 2005). For advancement of IPE the process of being interprofessional competent must keep on in daily clinical work.
Three steps could be identified, early, middle and final IPE, closely linked to one another.

To exemplify how necessary it is to train IPE on several occasions during the education/training, I will give an example from another professional world, a sort of metaphor. If one is going to set up a theatre act, one could either let the actors train their roles separately, but not rehearse or act together before the premiere evening. The actors might have good skills for the own roles, but don’t know how to act together in a role play.

The other perspective and the most natural way is to let the actors act together already during the rehearsals. In health and social care education, we train students to be professional actors in their own programmes, but being professional is not contradictory to being interprofessional. If we do not create an IPE curriculum for the students, we will have the same scenario as above, actors trying to play together and collaborate on the premiere night without even having seen each other before.
3.4 Group and Team

A team consists of a small number of people with complementary skills and commitment to a common purpose, performance goals, and an approach for which they hold themselves mutually accountable. A team holds regular meetings to discuss their goals and progress towards achieving those goals (WHO, 2008).

The team is a "mini-organization" and is described in several contexts as a critical cog in view of the overall tasks and goals. In the good team the individuals have different competences and collaboration arises under favourable conditions giving synergy effects (Sandberg, 1997; Sandberg 2006).

3.5 Collaboration and Co-operation

Collaboration is an active and ongoing partnership, often between people from diverse backgrounds, who work together to solve problems or provide services and share experiences. It can be distinguished from cooperation and co-ordination, which are less elaborate and less ambitious collective undertakings (WHO, 2008). The concept of collaboration is commonly defined through five underlying concepts; sharing, partnership, power, interdependency and process (Dâmore et al., 2005).
3.6 Team player

There are few formally accepted definitions of the team player concept, but there are a lot of lay prospective on this concept. An acceptable definition of team player could be; “A team player is a person who can function effectively as a part of a group, sharing information and striving towards a common goal. A team player cannot be selfish nor need recognition for one’s individual accomplishments.”

Tentative definitions of this concept are often found in organisational and economical publications and not least in sports. Here follows some views and definitions of the team player concept, derived from different documents:

A “Team Player” acts co-operatively with other health care professionals and has a complementary background and skills in a dynamic process of “teamwork” and also in sharing common goals (Xyrichis et al., 2008).

A team player is one who subordinates personal aspirations and works in a coordinated effort with other members of a group, or team, in striving for a common goal. 
http://www.cosmolearning.com/topics/teamwork-422/, 2010-11-04

“A team player must be motivated to be successful. This coincides with a having good attitude. A friendly personality is also good to keep the other players in harmony. A team player will discuss his/her ideas, give extra time and anything else to help the team as a whole” http://www.megaessays.com/viewpaper/24614.html, 2010-11-04

“A team player strives for accomplishment by showing no concern for his/her own individual needs. A team player motivates the people around him/her by always having a positive attitude. In not being selfish, a team player will always put the needs of others ahead of his/her own needs.” http://www.wowessays.com/dbase/ac2/krc271.shtml, 2010-11-04
A medical student in the last semester at the FHS in Linköping describing team players; “The team players need to believe and trust that every player can do the job. Every player has certain qualities and strengths, and a team needs different types of players. A coach, who may be a doctor, a nurse or a physical therapist, depending on the situation, will make sure that everyone is aiming for the same goal and that there are no misunderstandings about tactics. Every now and then, the players need to help each other out, finding new solutions and fight the opponent together to be able to win the game” (Svan Åström, 2011).

In sports, an example is a sports team full of “team players” and that this type of team has an advantage and could even beat a sports team only full of stars. On sports teams, a team player will sacrifice personal achievement to help the team keep winning and stay successful.

### 3.7 Teamwork

Teamwork is the process whereby a group of people with a common goal, work together, often, but not necessarily, to increase the efficiency of the task in hand. They see themselves as a team and meet regularly to achieve and evaluate their goals. Regular communication, co-ordination, distinctive roles, interdependent tasks and shared norms are important features (WHO, 2008).

Teamwork in health and social care is proposed as a dynamic process involving two or more health care professions with complementary backgrounds and skills, sharing common health goals and exercising a concerted physical and mental effort in assessing, planning or evaluating patient care (Xyrichis et al., 2008).

Different cultures in each health profession, which includes values, beliefs, attitudes, customs and behaviours, contribute to the challenges of effective interprofessional teamwork. Professional culture also includes social class and gender (Hall, 2005).
There is an increasing awareness of the need for health care professionals to be proficient in teamwork demands for health care faculties to develop learning opportunities for their students. The Swedish National Board of Health and Welfare, 2006, has defined new competence goals for state registration and certification of health care professionals. For example, nurses should be able to define their own and other professions’ knowledge in teamwork and encompass a holistic view of the patient. Physicians should be able to work in teams and collaborate with other professions in health and social care.

In a literature review, Maslin-Prothero, 2010 found key themes for integrated team working. They were: drivers, barriers and benefits of integrated working; staff development; and meeting the needs of service users. Well-functioning IP team can be regarded as community of practice (Wenger, 1998).

3.8 Cognition

Cognition is the scientific term for "the process of thought". Usage of the term varies in different disciplines; for example, in psychology and cognitive science, it usually refers to an information processing view of an individual's psychological functions. Other interpretations of the meaning of cognition link it to the development of concepts; individual minds, groups, and organizations.

In a large systemic perspective, cognition is considered to be closely related to social and human organization functioning and constraints.

Social cognitive theory describes learning as occurring through dynamic reciprocal interaction of individuals, their behaviour and the environment (Mann et al., 2009). A central tenet of social cognitive theory is learning through observation. When new behaviour is acquired through observation alone, the learning appears to be cognitive (Bandura, 1986). Bandura also believes that learning theory must include internal cognitive variables.
3.9 Metacognition

The term "metacognition" is often associated with John Flavell. According to Flavell, 1979 and 1987, metacognition consists of both metacognitive knowledge and metacognitive experiences or regulation. Metacognitive knowledge refers to acquired knowledge about cognitive processes, knowledge that can be used to control those processes. Flavell further divides metacognitive knowledge into three categories: knowledge of person variables, task variables and strategy variables.

Metacognition refers to higher order thinking which involves active control over the cognitive processes engaged in learning. Activities such as planning how to approach a given learning task, monitoring comprehension, and evaluating progress towards the completion of a task are metacognitive in nature. Because metacognition plays a critical role in successful learning, it is important to study metacognitive activity and development to determine how students can be taught to better apply their cognitive and communicative resources through metacognitive control (Livingston, 1997).

The metacognitive domain of research in its original version was developed within a psychological discourse (Flavell, 1979, 1987). In study II we would, however, like to broaden the concept to comprise also metacognitive processes in groups as well as the related phenomena of reflection in and on action (Schön, 1987; Clark, 2009; Sandars, 2009; Wackerhausen, 2009). In an interprofessional context, there is a need for reflection on professional as well as interprofessional competence and this fact calls for a somewhat wider meaning of metacognition than the definition proposed by Flavell. Developing Flavell’s theories of metacognition into the context of interprofessional learning, could help the interprofessional team (IPT) to think about metacognitive processes in the team. By planning how to think and act in complex situations/tasks (need of more than one profession) the IPT can control the total knowledge and skills within the group and use them for strategic acting. Evaluation of the processes will give the team members a wider perspective, more knowledge and experience, i.e. it will be beneficial for the patient.
3.10 Competence

While there is no widely accepted definition of competency, Hoffman, 1999 presented three different definitions: observable performance; the standard or quality of outcome of the person’s performance; or the underlying attributes of a person such as his/her knowledge, skill and abilities. Which of these three definitions is adopted depends on how the competencies will be used (Wood et al., 2009).

3.11 Profession and Professional Competence

Historical professions were occupations with power in society, examples being priests and judges. The priest and the judge were men with wisdom, knowledge and skill; people could thrust them.

Today education in health and social care is called professional education and often leads to certification, which has been given by the government. Society accepts a profession as being well-defined, powerful and trustful.

Characteristic of a profession are according to Caplow (1954);

- Members of a profession have an own organization, which includes or excludes persons depending on education and graduation.
- The title is protected; no one without the proper education can use it.
- A profession has formal ethical codes.
- A profession is officially accepted and legalized by examination, often certified.

“Profession” is the concept of professions and hence professionalism is best explained by reference to certain characteristics: self regulation,
competence based on specialist knowledge; provision of training and education and the means of testing for competence; organization of members; a code of conduct; and the province of an altruistic service, i.e. the work is not just done for financial reward (WHO; 2008).

Personal development in education is a learning process involving experiences, knowledge, skills and the outcomes leading to a change in attitudes (Parsell et al., 1998). Therefore, students have to be trained during their education in, for example, reflection on knowledge and skills, lifelong learning, personal learning style, “thinking about thinking”, i.e. metacognition, personal norms, values, morals, ideologies and attitudes, and being fostered to be personally competent.

To be professional is not the same as having a profession. The learning processes for becoming professionally competent can be described in terms of specific knowledge and skills, such as “professional models” or “cognitive maps”, the knowledge base underlying a particular profession (Petrie, 1970; Clark, 2006). Cognitive maps represent the entire paradigmatic and conceptual apparatus used by a profession (Petrie, 1970; Clark, 2006). In addition to cognitive maps, professions have normative maps including role, culture, norms standards and values in the profession. Specific methods and tools for diagnosis and evaluation are also important parts of professional competence.

A competence-based education approach is a disciplined approach to specify the health problems to be addressed, identify the requisite competencies required of graduates for health-systems performance, tailor the curriculum to achieve competencies, and assess achievements and shortfalls. Epstein et al., 2002 defining competency as; “Competency is the habitual and judicious use of communication, knowledge, technical skills, clinical reasoning, emotions, values, and reflection in daily practice for the benefit of the individual and the community being served”(Frenk et al, 2010).
3.12 Interprofessional Competence

The learning processes to become interprofessionally competent cannot be separated from the process of becoming professional, but are described as having knowledge together with other professions (general common knowledge base) shown in Figure 4, a common language for communication and general working methods.

Figure 4. Building interprofessional competence.

These include problem solving and metacognitive structures/models which underpin interprofessional teamwork, collaboration in IPT to find the best quality of care for the patient and acting validity or intelligent acting. John Dewey described intelligent acting as working by reflection, problem solving, analysing and critical thinking (Hartman et al., 2004). A platform can prevent stereotypical thinking and hierarchical organisations models and provide tools for effective teamwork (Allchin et al., 2009).
Using grounded theory, the Interprofessional Capability Framework, United Kingdom, defines interprofessional capabilities as comprising four key domains: knowing in practice, ethical practice, interprofessional learning and reflection (learning) (Walsh et al., 2008). The British Columbia Competency Framework for Interprofessional Collaboration, Canada (Wood et al., 2009), is organized into three domains: interpersonal communication skills, patient-centred and family-focused care and collaborative practice (collaborative decision-making, roles and responsibilities, team functioning and continuous quality improvement). Five important domains are defined in these findings: teamwork and group processes, reflection and documentation, communication, “together knowledge”, a general common knowledge base and ethics. The domains reflection and communication are both tightly connected to Flawells theories of metacognition.

Soubhi et al., 2009, call collective capability the ability of a group of professionals to balance two interdependent levels of organizations of practice: what professionals know and what they do collectively over time. In those terms, could the gaps in the ability to be interprofessionally competent be filled or reduced to the maximum capability of each individual?
4. AIMS OF THE THESIS

4.1 General aims

The overall aims of this research were to define, describe and measure the effects and outcomes of interprofessional education/learning.

4.2 Specific aims

- to describe the Linköping IPE curriculum and the outcomes, study I.
- to try to understand and define interprofessional competence, study II.
- to determine whether an extensive commitment to interprofessional training in the medical curricula jeopardizes the traditional skills or provide an additional asset for the medical students, study III.
- to study whether newly graduated nurses who have been trained in IPE during their education perceive that they have been prepared for collaboration with other professions, study IV.
- to study whether students who have had an early introduction to interprofessional training are more open-minded about cooperation with other professions when they arrive on the student training wards, study V.
5. SUMMARY OF THE PAPERS

Overview of the papers

The thesis is built on five studies both quantitative and qualitative approaches have been used in the field of interprofessional education and learning. In, Table 1, an overview of the papers concerning; type of study, type of data, data collection and data analysis is presented.

Table 1. Overview of the studies.

<table>
<thead>
<tr>
<th></th>
<th>Study I</th>
<th>Study II</th>
<th>Study III</th>
<th>Study IV</th>
<th>Study V</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Type of study</strong></td>
<td>Descriptive</td>
<td>Descriptive</td>
<td>Assessment</td>
<td>Assessment</td>
<td>Cross-sectional</td>
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<td></td>
<td>Retrospective</td>
<td>Prospective</td>
<td>Intervention</td>
<td>Intervention</td>
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<tr>
<td><strong>Type of data</strong></td>
<td>Qualitative</td>
<td>Qualitative</td>
<td>Quantitative</td>
<td>Quantitative</td>
<td>Quantitative</td>
</tr>
<tr>
<td><strong>Data collection</strong></td>
<td>Educational documents</td>
<td>Model Educational documents</td>
<td>Questionnaire</td>
<td>Questionnaire</td>
<td>Questionnaire</td>
</tr>
<tr>
<td></td>
<td>Assessments</td>
<td>Educational</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>Articles</td>
<td>documents</td>
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<tr>
<td></td>
<td>Documentations</td>
<td>from students,</td>
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<td>from students,</td>
<td>teachers and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>study directors</td>
<td>study directors</td>
<td></td>
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</tr>
<tr>
<td><strong>Data analysis</strong></td>
<td>Process or</td>
<td>Theoretical</td>
<td>Mean-value</td>
<td>Mean-value</td>
<td>Mean-value</td>
</tr>
<tr>
<td></td>
<td>Implementation</td>
<td>integration of</td>
<td>t-test</td>
<td>ANOVA</td>
<td>ANOVA</td>
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<tr>
<td></td>
<td>analysis</td>
<td>data</td>
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</tbody>
</table>
5.1 Study I

“Twenty years experience of Interprofessional Education”

The study approach is to define concepts and describe pedagogical models in IPE. Definitions of concepts are the first steps in developing theories in a new research area.

5.1.1 Material

By using IPE educational documents, assessments, articles and one’s own documented experience, we had access to a variety of data collected (assessments, articles and educational documentation) which could be regarded as a process or implementation analysis of data.

5.1.2 Methods

The authors have read the documents from the first plans for a new design of education in health and social care at the Faculty of Health Sciences at the University of Linköping, which is ultimately about interprofessional education. The most important documents have been chosen and condensed and the essential parts of them are presented in the text. Articles produced about the faculty have been read and those which highlighted IPE are cited. To describe the outcome of IPE, we have gone through all assessments made of IPE at the faculty every semester, both those made by students and teachers and assessments made by other researchers (Bredäng, 1991). This material gives a view of how IPE has developed over time. The experiences in the study have been written down after several meetings with teachers in the IPE curricula concerning the most important parts of IPE and how to be successful when implementing the IPE curricula. Findings are presented in Table 2.
Table 2. Interprofessional learning within designated learning modules at the Faculty of Health Sciences.

<table>
<thead>
<tr>
<th>Students</th>
<th>All programmes</th>
<th>All programmes</th>
<th>OT, PT, Med, Nurs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Time</td>
<td>1st semester/8 weeks</td>
<td>4th or 5th semester/2 weeks</td>
<td>6th semester (9th, 10th med.), 2 weeks</td>
</tr>
<tr>
<td>Setting</td>
<td>Tutorial groups of 8-9 members from different programmes</td>
<td>Tutorial groups of 8-9 members from different programmes</td>
<td>Interprofessional student teams of 5–7 members</td>
</tr>
<tr>
<td>IPL aims</td>
<td>To develop a base of common values and a holistic, multifaceted view of man (bio-psycho-social). To introduce problem-based learning and group work. To acknowledge differences in perspectives and definitions from various theoretical and professional standpoints.</td>
<td>To test and consolidate one’s own emerging professional identity in contrast to that of others.</td>
<td>To investigate limits of own professional performance in contrast to that of other individuals and professions. To acknowledge and value interprofessional differences. To test team skills under realistic conditions</td>
</tr>
<tr>
<td>IPL content</td>
<td>Presentation of self as an individual; personal learning style and experiences. Decision-making in a group. Evaluation of/reflection on own and group performance. Health professional ethical codes. Professional stereotypes.</td>
<td>Presentation of self as a professional in role play and interprofessional problem-solving activities/PBL cases.</td>
<td>Presentation of self as a “performing/clinical” professional. Experience dependency on other professions. Organize, carry out, evaluate and improve work in a clinical setting in co-operation with others.</td>
</tr>
<tr>
<td>IPL issues</td>
<td>Perspective of knowledge - relevance, sources, levels, richness etc. Individual and group attitudes and habits.</td>
<td>Merits and limits of own profession. Multidisciplinary problem-solving</td>
<td>Organization of IP teams</td>
</tr>
<tr>
<td>IP learning outcomes</td>
<td>Ability to - Cooperate in mixed group. - Understand other health science professions - Awareness of own preconceptions and prejudices</td>
<td>Ability to - handle and use differences between professional and theoretical perspectives</td>
<td>Ability to - actively take part in the organization and evaluation of IP workgroups, - describe and develop one’s own and others professional role and identity, - contribute to joint planning and implementation of decisions</td>
</tr>
</tbody>
</table>
5.2 Study II

“How to think about Interprofessional Competence – a metacognitive framework and model”

In this study we describe a metacognitive model of how to act professionally (Forslund, 2001; Forslund & Jacobsen, 2010) and illustrate how this model can be used in interprofessional education and learning.

The model comprises six basic components of professional competence and the way they are related and interact. As a result of the description and an additional seventh component, a personal professional profile is suggested. The components of the model are connected and discussed in terms of theories of learning by such thinkers as Schön, Dewey, Mead and Kolb (Schön, 1987; Hartman et al., 2004; Mead, 1934; Kolb, 1984). The metacognitive model, see Figure 5, below, concerning professional acting can be used on three levels: individual, team and organization, and is useful in different contexts.

Figure 5. The model comprises seven basic components of professional competence and how they can be related to and influence each other.
By using the model and exemplifying IPE learning situations, the study will look at how to think about interprofessional competence both as designers of curricula and as students.

This study points out the necessity of having tools in interprofessional teamwork, such as shared metacognitive structures/models, to ensure that teamworkers/students in health and social care can be successful in interprofessional learning and develop personally and professionally to improve the quality of care. Findings are presented in Table 3, 4 and 5.

Table 3. Early in the curriculum.

<table>
<thead>
<tr>
<th>Domain</th>
<th>Learning situation</th>
<th>Expected outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teamwork and group processes</td>
<td>Practising and study group processes</td>
<td>Awareness of myself and how I function in groups</td>
</tr>
<tr>
<td>Reflection and documentation</td>
<td>Introducing learning style instruments in small groups and discussing different learning styles Documentation in a portfolio</td>
<td>Awareness of my learning style, how do I learn best, “thinking about my own thinking”, being aware of metacognitive processes; Starting point of awareness of one’s own development</td>
</tr>
<tr>
<td>Communication</td>
<td>Evaluation by, for example, video-taping the small group. Discussing differences in professional culture, language, acting</td>
<td>Evaluation of my own actions and how the small group is working Awareness of the need for a common language</td>
</tr>
<tr>
<td>Shared knowledge or general common knowledge base</td>
<td>Introducing general “thinking models”, for example, the problem-solving process in problem-based learning (PBL) or the plan, do, study, act (PDSA) tool and laws in health and social care</td>
<td>Shared use of tools when discussing and acting Awareness of general laws and rules for all health and social professions</td>
</tr>
<tr>
<td>Ethics</td>
<td>Introducing awareness of one’s own norms, values, ideologies compared to the guidelines for the shared professional value platform/ethical norms</td>
<td>Awareness of my personal ethics and comparing it to that of my future profession</td>
</tr>
</tbody>
</table>
Table 4. In the middle of the curriculum

<table>
<thead>
<tr>
<th>Domain</th>
<th>Learning situation</th>
<th>Expected outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teamwork and group processes</td>
<td>Evaluation of group processes</td>
<td>Ability to give and receive feedback</td>
</tr>
<tr>
<td></td>
<td>Using metacognitive models:</td>
<td>Training in using metacognitive tools in the small group</td>
</tr>
<tr>
<td></td>
<td>for example, problem-solving or PDSA</td>
<td>Cognitive development in groups</td>
</tr>
<tr>
<td></td>
<td>Working together on complex cases/scenarios</td>
<td></td>
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<tr>
<td></td>
<td></td>
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</tr>
<tr>
<td>Reflection and documentation</td>
<td>Documentation in a portfolio, for example, writing one's own report of a complex</td>
<td>Increased ability to reflect on complex cases and awareness of others' perspective</td>
</tr>
<tr>
<td></td>
<td>case and discussion and evaluation of the case at a seminar</td>
<td>Increased documentation ability and further personal development</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Communication</td>
<td>Discussing how to meet the patient/client</td>
<td>Understanding the need for using different pedagogical approaches to different</td>
</tr>
<tr>
<td></td>
<td>Discussing how to inform the patient</td>
<td>patients</td>
</tr>
<tr>
<td></td>
<td>Role playing based on professional/patient encounters in a realistic patient/professional scenario and evaluating it</td>
<td>Understanding different roles: patient, practitioner, professions</td>
</tr>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shared knowledge or general common</td>
<td>Using knowledge acquired from the first IPE curriculum and becoming aware of</td>
<td>Understanding of one’s own knowledge, other professions’ knowledge and general</td>
</tr>
<tr>
<td>common knowledge base</td>
<td>differences in knowledge</td>
<td>knowledge</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethics</td>
<td>Discussions of ethical dilemmas in complex cases from different professions</td>
<td>Being able to discuss ethical dilemmas from one’s own profession and see other</td>
</tr>
<tr>
<td></td>
<td></td>
<td>professions’ perspective on the situation</td>
</tr>
</tbody>
</table>
Table 5. Late in the curriculum

<table>
<thead>
<tr>
<th>Domain</th>
<th>Learning situation</th>
<th>Learning outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teamwork and group processes</td>
<td>Placement on a student training ward in IP teams</td>
<td>Active participation in the organization and evaluation of the IP team</td>
</tr>
<tr>
<td>Reflection and documentation</td>
<td>Shared patient data documentation</td>
<td>Deeper understanding of patient/client documentation, perhaps in a shared document&lt;br&gt;Deeper understanding of being reflective, thinking critically and analytically in complex cases to find the core problem in the patient/client situation</td>
</tr>
<tr>
<td>Communication</td>
<td>Discussions in the IP team about the patient/client situation, the central problem, treatment and rehabilitation</td>
<td>Understanding how important it is to have a common language, metacognitive tools and a common platform to facilitate communication</td>
</tr>
<tr>
<td>Shared knowledge or general common knowledge base</td>
<td>Discussions in the IP team about knowledge, skills, culture and roles in different professions</td>
<td>Understanding one's own and others' knowledge and skills and differences in the province of shared meanings</td>
</tr>
<tr>
<td>Ethics</td>
<td>Discussions in the IP team of real patient/client situations and decision-making</td>
<td>Understanding how to use general ethical and professional guidelines in real cases&lt;br&gt;Acting for the best treatment/rehabilitation of the patient/client</td>
</tr>
</tbody>
</table>

Table 3, 4, 5, exemplifies learning situations early, in the middle and late in IPE curricula, focusing on five important domains: teamwork and group processes, reflection and documentation, communication, shared knowledge and ethics.
5.3 Study III

“Does Interprofessional education jeopardize medical skills?”

In this study we have assembled the data from the Swedish Medical Association and they have also done the basic statistics. There has been no randomization, stratification or blinding in this study as it is a national study of all graduated doctors in Sweden every year.

5.3.1 Participants

The Swedish Medical Association has conducted national, independent surveys annually (2000 - 2004) of all newly examined and registered medical doctors (approximately n = 700 annually and, in total, N = 3 534 during this 5- year period) from all six medical faculties in Sweden. The response rate has been approximately 85% each year.

5.3.2 Methods

Questionnaire

The questionnaire has been constructed, tested and found valid in a previous study (Hård af Segerstad, 1998). A research group from the philosophy faculty of Linköping University developed the questionnaire by interviewing students and teachers about the most central goals in their education to become a professional medical practitioner. From these interviews, the questions in the instrument were developed and constructed. The research group also made a pilot study before the main study.

The survey focuses on the extent to which respondents consider that their undergraduate education has developed their skills and abilities for their future medical specialization. The following eight issues were raised in the surveys: collaborate with other professions/colleagues in health care, leadership, communication with patients, readiness for a life-long
learning process, interest in research, medical handling of acutely ill patients and practicing preventive care.

**Data collection**
The questionnaire was sent to all students who had finished the medical programmes in Sweden a year ago, the whole population of medical students that year. All questions were answered on a six-point Likert scale, from 1 “I completely disagree” to 6 “I completely agree.”

**Statistical analysis**
The data consist of the whole population and are presented as mean values for each cohort (university).

**5.3.3 Results**
The newly registered medical doctors educated at the FHS at Linköping University exposed to IPE and PBL reported significantly (p < 0.0001) more confidence that their undergraduate studies had given them interprofessional skills and abilities to collaborate with other professions than medical students from the other medical faculties in Sweden. These results have been solid and consistent for the last five years and thus up to today. In contrast, there were no significant differences between Swedish medical faculties in the former students’ confidence that their education had given them skills to handle acutely ill patients medically.

**5.4 Study IV**

“Nurses with IPE curricula during training think they are better prepared to work with other professions”.

This study is a comparison of IPE vs. non-IPE universities. Three universities with different commitments to interprofessional education were studied. One of the universities was labelled the “IPE University.” For over 20 years this university has had an extensive interprofessional
commitment, offering an IPE curriculum for all their students in the health sciences (Areskog, 1992; Areskog, 2009; Wilhelmsson et al., 2009). This university also features problem-based learning as the pedagogical method (Silén, 1996; Silén et al., 2008; Dahlgren, 2009). All health care students at this university are exposed to IPE activities for at least 12 weeks during their undergraduate education, from integrated courses early on and in the middle of their education to a final two-week interprofessional practice on a student training ward (Fallsberg et al., 1999; Fallsberg et al., 2000; Wahlström et al., 1996; Wahlström et al., 1998). The two other studied universities were labelled “none-IPE Universities” since they have a more traditional curriculum design. Their curricula highlight other issues such as communication, family care, IT and international perspectives, and not IPE.

5.4.1 Participants

One year after graduation, 554 nurses from the three universities were invited to participate in the study, out of which 303 nurses filled in the questionnaire after one reminder, giving an overall response rate of 55%. At the “IPE University”, 183 nurses answered (response rate 59%) and at the “non-IPE Universities”, 120 nurses filled in the questionnaire (response rate 49%).

5.4.2 Methods

Questionnaire
The questionnaire used in this study is based on the same previously presented questionnaire in study III (Hård af Segerstad, 1998).

Data Collection
A questionnaire focusing on how undergraduate studies had prepared the students for a set of educational targets was posted to all students one year after graduation from nursing programmes at universities in the southeast of Sweden. The questionnaire was sent together with an informational letter to the respondents in 2008. The sex and age
distribution were comparable at the three universities, with no significant differences in this respect.

**Statistical Methods**
All data were stored in a database and statistically analysed using the Statistical Package for the Social Sciences (SPSS) 18.0 software (Chicago, IL, USA). ANOVA was used for univariate tests. A p value of < 0.05 was considered statistically significant.

Figure 6. Perceptions among nurses of how their undergraduate education has prepared and developed their collaboration skills with other health care professions. (Percentage on a 6-degree Likert scale from “Completely Disagree” to “Completely Agree”.)
5.4.3 Results

Nurses who had been exposed to interprofessional curricula during their undergraduate education reported to a significantly greater extent ($p = 0.003$) that they were prepared to work as a nurse. Furthermore, they also reported to a significantly greater extent ($p < 0.0001$) that their undergraduate education had prepared them to work with other health care professions as shown in Figure 6 and also to communicate with patients ($p = 0.006$), shown in Figure 7.

Figure 7. Perceptions among nurses of how their undergraduate education has prepared and developed their communication skills with patients. (Percentage on a 6-degree Likert scale from “Completely Disagree” to “Completely Agree”.)
5.5 Study V

“Are females in general and nursing students the “team players” in health care?”
A cross-sectional design was used in this study. The Readiness for Interprofessional Learning Scale (RIPLS) was used to measure the students’ readiness for interprofessional learning and their open-mindedness to collaborate with other professions (Parsell et al., 1998; Parsell et al., 1999). Two universities in Sweden, both with undergraduate medical and nursing educational programs were chosen as sites for the data collection.

5.5.1 Participants

For over 20 years, the “IPE University” has pursued an extensive interprofessional commitment offering an IPE curriculum to all their students in the health sciences. This university also utilizes problem-based learning as the pedagogical method (Silén, 1996; Silén et al., 2008). All health care students are exposed to IPE activities for at least 12 weeks during their education, ranging from integrated courses in health, ethics and learning for 10 weeks, both early on and in the middle of their educational programme, to a final two weeks of interprofessional practice on a student training ward at the end of their professional education (in the 8th semester for the medical students and the 6th and last semester for the nursing students) (Areskog, 1992; Areskog, 2009; Wilhelmsson et al., 2009; Wahlström et al., 1996; Wahlström et al., 1998). The “IPTW University” has a mandatory two-week IPE course for nursing, medical, occupational therapy and physiotherapy students on interprofessional training wards. During this course the medical students are in their 8th semester of 11 and the nursing students, as well all the other students, are in their 6th and last semester (Hylin et al., 2007; Ponzer et al., 2004). The students are also offered other IPE activities (e.g. an IPE day in primary care, seminars on ethics) during their education/training,
but these activities are voluntary and usually available during the students’ elective study periods (Lewitt et al., 2010).

At both universities students from medical and nursing programmes were invited to participate in the study. At the time of data collection, the medical students were starting their third or eighth semester and the nursing students their third or fifth or sixth semester. These semesters were deliberately chosen so that none of the students had participated in their upcoming two-week practice on the IPTWs. Students in semester 3 were labelled as “early” in their education in the analysis and students in semesters 5 to 8 were labelled as “late”.

5.5.2 Methods

Questionnaire
The Readiness for Interprofessional Learning Scale for evaluating interprofessional learning activities was originally presented by Parsell et al. in 1998 and 1999. The development of the RIPLS involved a conceptual framework based on evidence from the literature covering social and psychological theories and adult learning theory but also included professional expertise drawn from experiences in implementing interprofessional learning for health care students (Parsell et al., 1998; Parsell et al., 1999). It consists of 19 items scored on a five-point Likert scale. All participants receive a score from 1 (completely disagree) to 5 (completely agree) for each of the 19 items. These items are then categorized into three main factors: Teamwork and Collaboration (items 1–9), Professional Identity (items 10–16) and Roles and Responsibilities (items 17–19).

Data Collection
The data collection was conducted in connection with introductory lectures at the universities for both the medical and nursing students at the beginning of the autumn semester in 2009. The students were informed both orally and in a written leaflet about the study and were
invited to fill in the questionnaire anonymously. After completion, the questionnaires were collected immediately. The questionnaire included an established psychometric instrument, RIPLS (Parsell et al., 1998, Parsell et al., 1999), and the following background variables: gender, age group, university, educational programme, semester and whether the student had any previous experience of working in health care.

**Statistical Methods**

All data were stored in a database and statistically analysed using the Statistical Package for the Social Sciences (SPSS) 18.0 software (Chicago, IL, USA). A factor analysis was applied to examine the factorial structure in our collected data from the previously translated Swedish version of RIPLS. Cronbach’s alpha was used to assess reliability in terms of internal consistency. ANOVA was then used for univariate tests between the independent variables and the items in the RIPLS, and mean and standard deviations were also calculated. Thereafter, a multiple regression analysis was performed for each of the four identified factors, as well as for each of the 19 different questions in the RIPLS as dependent variables. The variables gender, medical vs. nursing programme, “IPE University” vs. “IPTW University” and previous experience of working in health care were used as independent variables. A calculation of means and standard deviations for each of the four identified factors was done for all participants, without any weighting for individual items. Intercorrelation coefficients between the factors were calculated using Pearson regression analyses. A p value of < 0.05 was considered statistically significant.

**5.5.3 Results**

The RIPLS scale has previously been used in different situations and for different student populations to evaluate interprofessional learning activities (Hind et al., 2003; Hornsburgh et al.; 2001; Mackay, 2004; Baxter, 2004; Morrison et al., 2004; Reid et al., 2006). The Swedish version of the RIPLS, cross-culturally adapted to Swedish conditions and translated into Swedish (Lauffs et al., 2008), was used in this study.
The original factor structure was maintained when launching the Swedish version of the RIPLS (Lauffs et al., 2008). However, in some studies where the RIPLS has been applied after its introduction, the factor structure and also some of the items have been suggested to be altered (Reid, et al, 2006; Lauffs et al., 2008; McFadyen et al., 2005). Initial tests showed that our data did not reflect the original factor structure of the RIPLS. Nor did the data support the internal consistency values of the subscales as previously reported. In the present study, we therefore decided to do a renewed factor analysis of the 19 items of the original RIPL Scale. Our factor analysis gave four factors instead of the originally proposed three and also a slightly different order of the 19 items. The factors were: Factor 1 (11 items, questions 1–6, 9 and 13–16), Factor 2 (4 items, questions 10–12 and 18), Factor 3 (2 items, questions 17 and 19) and Factor 4 (2 items, questions 7 and 8).

Table 8. Internal consistency of the four identified factors in this study of the Readiness for Interprofessional Learning Scale (RIPLS).

<table>
<thead>
<tr>
<th></th>
<th>Number of items</th>
<th>Cronbach’s alpha</th>
<th>Item means</th>
<th>Min/max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Factor 1</td>
<td>11</td>
<td>0.88</td>
<td>4.01</td>
<td>3.63/4.52</td>
</tr>
<tr>
<td>Factor 2</td>
<td>4</td>
<td>0.51</td>
<td>2.14</td>
<td>1.98/2.31</td>
</tr>
<tr>
<td>Factor 3</td>
<td>2</td>
<td>0.42</td>
<td>2.57</td>
<td>1.83/3.31</td>
</tr>
<tr>
<td>Factor 4</td>
<td>2</td>
<td>0.38</td>
<td>4.66</td>
<td>4.65/4.67</td>
</tr>
</tbody>
</table>
The internal consistency of the four factors was assessed by Cronbach’s alpha as shown in Table 8. The internal consistency of the total RIPLS (all 19 items) gave a Cronbach’s alpha of 0.62 (Item mean, 3.57, and a min/max of 1.84/4.68). The Cronbach’s alpha value of 0.88 for the cluster of items in factor 1 indicates a high internal consistency and that these 11 items represent a relatively unitary factor. After considering the essence of these 11 items and using face validity analysis, we decided to label this factor “Team Player”. However, the reordering of the RIPLS scale suggested by the factor analysis of our empirical data was not satisfactory in terms of numbers of items in three of the factors (factors 2, 3 and 4). Nor was it satisfactory in terms of Cronbach’s alpha values that were all below 0.60 for these three factors. The Cronbach’s alpha value is generally recommended to be over 0.60 to consider a cluster of items as a genuine factor (Shea et al., 2002). Therefore, we decided to omit these three clusters as factors, but the individual questions remain as single RIPLS items in the forthcoming analysis.

The standardized maximum likelihood estimates of the factor loadings for the 11 items in the factor Team Player are displayed in Table 9. The factor loading values for the items in the factor were acceptable, except for question 2.
Table 9. Standardised maximum likelihood estimates of the factor loadings for the 11 items included in the factor “Team Player” and items not included in this item group.

<table>
<thead>
<tr>
<th>Factor 1. “Team player”:</th>
<th>Factor loading</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Shared learning with other healthcare students will increase my ability to understand clinical problems (Q3).</td>
<td>0.71</td>
</tr>
<tr>
<td>- Shared learning will help me to think positively about other professionals (Q6).</td>
<td>0.71</td>
</tr>
<tr>
<td>- Shared learning with other healthcare students will help me to communicate better with patients and other professionals (Q13).</td>
<td>0.71</td>
</tr>
<tr>
<td>- Shared learning before qualification will help me become a better team-worker (Q16)</td>
<td>0.70</td>
</tr>
<tr>
<td>- Shared learning will help to clarify the nature of patient problems (Q15).</td>
<td>0.70</td>
</tr>
<tr>
<td>- Learning with healthcare students before qualification would improve relationships after qualification (Q4).</td>
<td>0.69</td>
</tr>
<tr>
<td>- I would welcome the opportunity to work on small-group projects with other healthcare students (Q14).</td>
<td>0.66</td>
</tr>
<tr>
<td>- Communication skills should be learned with other healthcare students (Q5).</td>
<td>0.65</td>
</tr>
<tr>
<td>- Shared learning will help me to understand my own limitations (Q9).</td>
<td>0.59</td>
</tr>
<tr>
<td>- Learning with other students will help me become a more effective member of a healthcare team (Q1).</td>
<td>0.58</td>
</tr>
<tr>
<td>- Patients would ultimately benefit if healthcare students worked together to solve patients’ problems (Q2).</td>
<td>0.53</td>
</tr>
</tbody>
</table>
6. METODOLOGICAL CONSIDERATIONS

6.1 Participants

In Study IV the overall response rate was rather low (54%) and especially the rate for the non-IPE universities (49%). However, it is not easy today to get people to answer questions by post. Although, we have participants in two different semesters, spring and autumn, and batched them together and got a total number of N=303 respondents.

In Study V the participation rates, a possible risk of mass significance and an uneven gender distribution among the respondents could be cited as possible limitations of the study. Although the overall response rate was over 70%, which is quite acceptable, the participation rates for the students at the “IPTW University” were lower (64%), which might have influenced the results. The fact that there are 19 single items in the RIPLS and several independent variables means that a number of significant tests were performed. This might raise the risk of mass significance. Therefore, significant differences for individual items on the scale should be interpreted with some caution, especially if the significance levels were close to the borderline (p = 0.05) for an accepted level. The uneven gender distribution among the participants in this study, with two thirds being female and only one third males, could influence the generalizability of the study. However, this phenomenon reflects the actual male/female ratios today in Sweden for the two studied educational programmes. Students in the nursing programme are predominantly females, but today the gender distribution in the medical programme is more even, with a slight predominance of females.
6.2 Material

Interprofessional education and learning is a new developing field of pedagogical research. When the research group started to search for articles in 2000 there was very little material. The articles, often produced in the United Kingdom, were about evaluations of single-day or one or two-week courses in interprofessional education. Nearly all of the articles referred to “the Linköping model” described by Areskog 1988, 1992, 1994 and 1995. The research team, which had been working on programme integration for a long time, realized that someone had to write down why, when and how our faculty started with IPE and continued.

The self-assessment instruments used in Studies III and IV might have some limitations. We don’t know for sure if the new graduates have the abilities or competencies, even though they express such skills. To measure skills or competencies which are complex and not well defined is not an easy task. Perhaps interviewing people who work in teams would be one way, e.g. asking about job satisfaction and stress levels. Another way of thinking about the problem could be patient satisfaction and quality of care with interprofessional teams versus traditional care.

6.3 Methods

Strength in our research is that we have used a variety of methods in the studies, both qualitative and quantitative designs. Reeves et al., 2010 believe that further rigorous mixed methods studies of IPE are needed to provide a greater clarity of IPE.

Could descriptive studies, like Studies I and II, contribute to the theoretical development of interprofessional learning? To build up a theoretical framework in a new research area takes many years. Science has to start somewhere: understanding, explaining and predicting the world we live in and developing science like Copernicus, Keple, Galilei, Newton and other researchers have done (Okasha, 2002). Science also has to start in the environment/context and then be theoretical; both on the
inductive and deductive level (Okasha, 2002). In descriptive studies it is up to the reader to judge the importance and value of the research.

The strength of the descriptive studies is that the research team has worked with interprofessional education for a long time, having knowledge and experience in the field. An inherent requirement in the pedagogical problem-based learning approach is to have a reflective and critical attitude to what you are working with in everyday working life and also to document it. This can also be regarded as a weakness: if you don’t think critically about what you are working with or don’t let others criticize your work, you can be blinded to your own work, with a consequent low level of objectivity. Critical thinking was first described by the pedagogical researcher John Dewey, who meant that analysing and problem-solving are parts of a concept which he called “acting intelligently” (Hartman, 2005). Reflection in action is an essential point in being professional (Schön, 1998). Researchers’ epistemological/theoretical stance could be objective and/or reflective; in high quality research, this can be achieved by establishing one’s distance from the data through guarantors of the objective or defining the exact nature of the reflexivity. In Study I we have described our reflected experiences and analysed documents/assessments in a critical way.

In Study III we used only two of the eight questions, as we were only interested in the issue “whether an extensive commitment to interprofessional education in the medical curricula jeopardizes the traditional skills (medical handling of acute patients).” The statistical methods in the article comprise the mean, standard deviation (SD) and t-test calculated by the Swedish Medical Association. In this article it might had been even better to use variation and significance testing with analyses of variance (ANOVAs). ANOVA separates and calculates variation in data depending on one or more variables. This could have been followed-up with a post hoc test, for example, the Bonferroni test.

Limitations of Study IV are that we have used an evaluation instrument and focused on only some of the eight questions (collaboration, communication and work as nurse), but we chose this approach because
we wanted to compare this data with our study on newly graduated doctors (Faresjö et al., 2006). The data were calculated simply using ANOVA since we only wanted to compare the three cohorts.

In a previous study in which the British RIPLS was tested for Swedish conditions, it was concluded that further analysis with other empirical material could enhance the factor structure and improve the model (Morison et al., 2004). In the initial factor analysis of our collected data in Study V, four groupings of items were identified, instead of three in the original scale. Our renewed factor analysis also indicated another order of the items in each factor. Our student sample was three times larger (n = 670 participants) than in the previous Swedish study (Lauffs et al., 2008) with only 214 participants, which might have had an impact on the factor analysis. General statistical recommendations concerning factor analysis often suggest that item groupings with a Cronbach’s alpha below 0.60 should not constitute a factor (Shea et al., 2002). In our study the Cronbach’s alpha for three of the groupings was less than 0.60. Therefore, we decided to omit these three as factors and treat the RIPLS items included in these groupings as single questions in the analysis. In agreement with other researchers (Reid et al., 2006; Lauffs et al., 2008; McFadyen et al., 2005), we believe that there is room for improvement and adjustments in the RIPLS. Our main contribution to this issue is the introduction of a factor that we have labelled “Team Player”. The denotation of this concept was decided upon after a face validity analysis performed by an interprofessional expert panel of health care educators, taking both the semantics and the conceptual essence of the factor into consideration. Nonetheless, “Team Player” should still be regarded as a tentative concept and its validity needs to be further elaborated upon in forthcoming research. A “Team Player” acts co-operatively with other health care professionals and has a complementary background and skills in a dynamic process of “teamwork” and also in sharing common goals (Xyrichis et al., 2008). Good examples of a “Team Player” are found in sports. A “Team Player” will sacrifice personal achievements to help the team win and continue to be successful.
6.4 Ethics

In the studies we have used instruments to evaluate students’ perceptions of how education has prepared them to work and their attitudes to interprofessional education/learning. Evaluating education is a part of learning and there are only negligible ethical considerations. The Ethics Committee reviewed and approved our studies and did not make any reservations. The control groups in Study IV, without the intervention of interprofessional education, are only involved in the normal curricula. Therefore no conflict is seen.

The Research Ethics Committee of Linköping University, Sweden, approved the studies (Dnr. 2010/26-31).
7. DISCUSSION

Emergency leading to creativity linked to the threatened closure of medical training at the beginning of 1980 started the process of including IPE and PBL in the Linköping medical education curriculum, as described in study I. There were many who believed that the Linköping education model would explode, but today the IPTW has spread to 13 hospitals in Sweden. Nevertheless, it has not been able to overturn the IPTW work model in usual practice in Swedish health care. More sadly, no other faculty in health sciences in Sweden has developed a thoroughly IPE curriculum yet. It is difficult to succeed with the introduction of new projects if they are managed only by enthusiasts. Projects must be anchored in the leadership and it must also be in favour of the implementation. IPE has not been legislated in Sweden even though Linköping University has had IPE for 25 years and the government has stated that teamwork with other professions is a target in medical education (Swedish National Agency for Higher Education, 2006).

Again thinking of the metaphor of a director of a theatre, setting up a production, he does not decide to let the actors rehearse their roles separately and then meet one another for the first time on the day when the production is going to be presented for the first time. Unfortunately, in Sweden, as in many other countries, students who are going to work together in health and social care organizations have not, for the most part, met one another other during their education/training, even though they are going to act every day in the same arena with the same patients and clients.

Is it possible to train students to be interprofessionally competent, filling the gap between ability and capacity? This issue is difficult to answer, but with our study II, we would like to point out the importance of having tools that can be used by all professions in order to facilitate the
work of the team. By using tools, the communication and collaboration between team members will perhaps become easier.

Can the constructors of a curriculum also design it so that the students can be trained to become more or less interprofessionally competent? It is very difficult to fully understand what outcome the curriculum will provide; one can only speculate. But to carefully think through how to train the students as described in study II, perhaps using metacognitive thinking, must be more effective.

Findings from national independent evaluations, presented in study III indicate that exposure to IPE in combination with PBL, as developed and implemented at the FHS at Linköping University, gives an additional asset, interprofessional competence to our students, which does not seem to compete or interfere with their professional medical skills, expressed as confidence in being able to handle acutely ill patients medically.

By using the same survey as in study III we asked students from the nursing programs at three different Universities to fill in the same questionnaire as the medical students. The main findings in study IV was that nurses who had recently graduated from the IPE University perceived to a greater extent that their undergraduate training had prepared them to work together with other professions in comparison with nursing students from non-IPE universities. These results are quite similar to previous findings in study III. The investment in interprofessional education during undergraduate education at the IPE University seemed to pay off, at least considering the students’ perceptions regarding whether they were prepared to collaborate with other professions. This seems to include both medical and nursing students. A perception can be merely an attitude and not reflect real-world action. However, having mental readiness for interprofessional collaboration with other professions is an important prerequisite and a good starting point for interprofessional action.

Only one University in Sweden has a thorough IPE curriculum even though nursing students, as reported in study IV, think that
interprofessional collaboration is an important goal in undergraduate education. One could raise the question of why so few universities in Sweden have an IPE curriculum when one of the targets for undergraduate education for nurses is “to develop a professional role in preparation for teamwork and collaboration among all staff groups” (Higher Education Act 1992:1434) and also in view of the Alma-Alta declaration, “Learning Together to Work Together” WHO, 1988, 2006, 2010. This issue must be discussed in relation to the question of how autonomous one is as an educational designer and how education is controlled to attain the targets recommended by the government.

In study IV nurses from the IPE University also reported to a significantly greater extent that leadership in health care was an important educational goal. An interesting finding is that nurses who have been trained in an IPE curriculum realized that leadership in health care is important. This finding might be interpreted to mean that nursing students who have met other professionals during their education and worked together with them in small groups have found out that there is no obvious leader. Nurses often expect the doctors to be the leaders, which is also the general picture in a traditional hierarchical health care system. On the other hand, practical everyday experiences during their education make many students realize that the personality of the human being is sometimes even more important in teamwork than one’s formal education.

The importance of the questions of “how your education has prepared you to work as a nurse” and “to communicate with patients” in study IV was also reported to be significantly higher among nurses from the IPE University. In other reports it was found that students who have been exposed to IPE curricula during their education were more confident upon qualification about their communicative skills, their interprofessional relationships and their professional interactions (Pollard el al. 2008). Students who encounter other ways of expressing and solving problems and different perspectives of phenomena might be widening their communicative skills. Interaction during education between students from different programs is also important for the
understanding of other professions’ working models, culture and language and, not least, for mirroring their own profession and being aware of both the core and the limits of their own profession.

In present-day Swedish health care it is important to be both “professionally and interprofessionally competent”, “to collaborate” and “to communicate” with both staff and patients when moving from a more traditional health care system to a more patient-centred system. In clinical practice, patients for the most part need help from more than one profession to solve their health problems (Headrick, 1998). Collaboration between professions must increase in modern health care because the body of knowledge is growing rapidly and no profession has a complete overview of the knowledge and skills in many areas.

The questions in the survey used in study III and IV (Hård af Segerstad, 1998) were based on the former medical students’ perceptions and therefore first and foremost reflect their attitudes, and not actual clinical performance, which might be a limitation in these studies. However, positive interprofessional attitudes expressed as confidence in one’s ability to collaborate with other professions are important prerequisites for interprofessional action and practice.

In study V we set out to investigate whether student characteristics such as gender, previous working experience in health care, educational progress and such features of the learning environment as educational programmes and curriculum design have an impact on the students’ readiness for inter-professional learning and how open-minded they are about collaboration with other professions. The main findings were that female students in general and nursing students had a more positive attitude to teamwork. Only to a minor extent did exposure to different interprofessional curricula affect the students’ attitudes to teamwork, and educational progress did not seem to alter these beliefs.

The finding that female students appear to take a more positive view of teamwork has also been reported in another recent Swedish study (Hansson et al., 2010). In many respects, young Swedish women of today
grow up in a more democratic and egalitarian society, a society that has strengthened women’s position. They convey an image of being equal to males and have expectations of working in such a way also in their occupation. However, the Swedish health care system still maintains traditional hierarchical structures, even though it is transitioning towards more teamwork and more patient-centred care. Women appear to be more willing to change the hierarchical health care system – a system built by men for men (Zelek et al., 2003). This might be due to the fact that hierarchical organizations often give women fewer opportunities to influence their working conditions.

Actually, women constitute the majority of medical students in Sweden today. In nursing education, the number of men is steadily increasing in Sweden, even though they are still in the minority, i.e. only about 10%. There are also differences in perspectives between these two educational programmes; nursing education in Sweden covers both behavioural (50%) and biological (50%) sciences, while 90% of the medical education is biologically oriented (Hultberg et al., 1998). Nursing students also seemed to welcome teamwork and collaboration. These findings are in accord with other reports (Hind et al., 2003). Students who had a positive view of their own profession also viewed other professions favourably (Hind et al., 2003).

Present-day Swedish society still holds stereotypical views of doctors and nurses. The male doctor’s role is valued to a greater extent as that of the most competent professional in the health care system due to his chief position in hierarchical organizations. While nurses are regarded as the women who take care of the “human” element, being the spiders in the net, linking together the pieces in the puzzle around the patient, and having an overview and a holistic approach, i.e. being the “Team Player”.

In other previous Swedish studies, medical students have reported scepticism about IPTWs after a two-week placement, expressing the view that the aim of the training was in conflict with their ambition to take on their new roles as physicians (Fallsberg et al., 1999; Ponzer et al., 2004). Medical students’ perceptions such as “I do not want to waste my time
attending courses together with others” (Item 10 in RIPLS) and “Other professions in health care have support functions to the doctor” (Item 17, in RIPLS), as expressed in this study V, are counterproductive to teamwork. The students at the “IPE University”, who had been exposed to interprofessional education (Areskog, 2009; Wilhelmsson et al., 2009) before the survey was completed, reported more positive attitudes towards teamwork in 4 out of 11 items in the factor “Team Player”, compared to the students at the "IPTW University". However, it should be noted that the students at the “IPE University” have also been exposed to a problem-based curriculum (Silén, 1996; Silén et al., 2008) and therefore are well acquainted with working in small groups.

It is possible that there are other important factors that influence the attitudes and beliefs about collaboration which we did not cover using the RIPLS instrument. Other factors that might be crucial and important for willingness to collaboration and participate in teamwork could involve the personality of the individual.

Traditionally, professional education leading to certification means that people who do not have the right education are not entitled to perform certain defined tasks. By having the exclusive right to work, one has power over others who cannot perform these tasks. As a professional with certification one can build barriers or understand one’s own unique knowledge. Special knowledge must be regarded as an important part in the teamwork, as important as the common knowledge and tools to improve the teamwork. In the team, it is also important to have democratic principles, being trustful of one another and having a humanistic view of human beings. Influences of gender and power in the organization within the team may be obstacles to a good climate of collaboration.

An important issue is why IPTW models/approaches are not reading to other parts of the health care system in Sweden. IPTW is still an isolated island, even if it is effective and students who work there feel comfortable and patients appreciate the care they receive. Are politicians and managers aware of how well the IPTW works? Who wants to remain
in traditional hierarchical health care systems and not develop the health care organisation today?

Have the IPE designed curriculum during training any significance? We have tried in studies III, IV and V to cast a light on this question, but could not find any strong evidence. There are other factors such as gender and what programme one is trained in, which are stronger and connected to the readiness to work together with other professions in health care. A question which then arises is whether to introduce additional resources for those groups who are not so willing to work in teams with other professions?

Social competence is important when working in teams. Students trained in the humanities, such as nursing students, are more willing to work together with other professions (Hultberg et al., 1998; Wilhelmsson et al., 2011). Can, perhaps, knowledge of humanist disciplines promote my approach to IPE or is it more a matter of general interest and/or personality?
8. CONCLUSIONS

To join all different levels, faculty, educational programmes, organizational bodies, and students around appropriate subjects for integration and inter-professional learning is easier said than done. Nevertheless, our faculty has now not only sustained for 25 years, but also continuously developed, the IPE curriculum.

The following is not a description of “how to do it” but rather a summary of our experiences in successful implementation of IPE. It is important to underline that IPE is criticized and challenged in different ways even within the organization and that the fundamentals and design require constant and vigilant scrutiny and reform. The most fundamental issue is that the organization and faculty should sympathize with IPE. A positive attitude to IPE within the faculty from the dean to professors, lectures and teachers is one of the main prerequisites for a favourable reception of the IP project amongst students.

To constantly evaluate, revise and discuss IPE in the organization and, in that process, remain all parts of the general goal of IPE, namely interprofessional practice. Every organization needs to be able to shift focus and address questions of different magnitude in its everyday work, without losing sight of the long-term objectives.

A leadership is needed with sufficient interest, knowledge and, preferably, experience, to legitimatize IPE. Interprofessional education is the art of the possible and levelling all kinds of interests is one of its main features in the organization as well as in performance.

Organizers of IPE certainly need diplomatic and interprofessional skills, constantly listening to all actors involved, arranging regular meetings with discussions on curriculum, content and, earnestly considering all perspectives of the subject. Process leadership is desirable. Support from
and close contact with faculty leaders in relevant positions are essential for success.

All programmes involved in IPE must have a sense of ownership, based on true influence and a conviction that IPE contributes to the moulding of professionals of today. The issues in the IPE curriculum must be selected carefully and designed to fit well from organizational and logistic aspects in order to have significance in the programmes. The involvement of faculty members from the different programmes in the IPE activities is crucial; they will be mediators in conflicts of interest and, hopefully, knowledgeable defenders in difficult times. They have a distinct role as co-designers of IPE activities and in the whole body of lecturers joined to solve common problems and ensure that true interprofessional learning will take place, thus adding to the critical mass of experience needed to drive the project over time.

Students and the students’ unions must be involved in the process. Students in the latter part of their education and with full experience of the IPE curricula are important individuals when reorganizing. They have a great influence as role models and ambassadors for freshmen and hesitant parts of the faculty. Former students who have had the opportunity to test their competence and reflect on the importance of their basic training may turn out to be the most influential advocates of IPE.

Small group learning, whether intra- or interprofessional, contributes considerably to the understanding of the "other" as a person, a professional or a representative of disciplines and organizational entities; interprofessional skills cannot be taught by others, but must be learnt in interaction with others.

Our experience is that faculty members are key actors for successful IPE. Their engagement in IPE will pass on to the students who will be engaged in IPE and IPE will be successful. To reorganize the IPE from the outcome of the evaluation of both the students and the teachers is also a key factor.
Is there a need for metacognitive thinking in teamwork? All professionals in health and social care have their own culture, language, knowledge and skills. Simply letting students work in teams does not necessarily mean that they are actually working as a team. If the team has common tools such as “metacognitive thinking models”, this will facilitate communication and understanding in the team. An example of good teamwork could be a football team. They are trained to be a team, but they also work on their own individual strengths and weaknesses to fit in with the team. The role of the coach is to evaluate the team and individual players before, during and after a match, indirectly by using metacognitive thinking.

This study points out the need for using metacognition in interprofessional education. The metacognitive model presented could contribute to understanding the complexity of interprofessional competence. However, a model is a model and can never fully cover a complex situation and is always a simplifier of reality.

The construction of IP curricula also has a key role to play if the IPL training is to be successful. The IP learning situations exemplified in this study may be helpful tools for IPE educators and for developing professional practitioners with a focus on the patient’s problem from more than one profession’s perspective (Hultberg et al., 1998; Mead, 1934; Wackerhausen, 2009). In the end, the overall winner of interprofessional practice has to be the patient.

We believe that defined courses (even early in the curricula) and student training wards can help undergraduate health science students gain interprofessional competence. In addition, problem-based learning that is based on student-centred learning in small groups also appears to be effective. It is warranted in further research also to follow up interprofessional and other competences of other health professional groups exposed to interprofessional education. The results in study III and IV strengthen the theory that students who have had an IPE
curriculum during their education have a more positive attitude to working with other professions.

The main findings in this study were that female students in general and nursing students had a more positive view of interprofessional learning and were more open-minded about collaboration with other professions. Only to a minor extent did exposure to a more extensive interprofessional curriculum promote a positive attitude towards teamwork. Nor did educational progress improve these beliefs.

A major challenge to modern health care is the need for more interprofessional teamwork to improve the safety and quality of patient-centred care. This study indicates some directions for more successful interprofessional education. Efforts might be directed at informing or even persuading male medical students in particular about the need for teamwork in modern health care systems. These results also imply that study of other factors, such as the student’s personality, is warranted to fully understand readiness for teamwork and interprofessional collaboration in health care. We also believe that there is room for improvement in and adjustments of the RIPLS Scale.
9. FUTURE RESEARCH

Forthcoming studies will include measurements of personality, which might be a way to enhance our understanding of interprofessional learning and competence. We also have material to study whether learning style has any impact on readiness for interprofessional learning.

In the general discussion I raised some central questions that are highly important to study:

- Has the IPE designed curriculum during training any significance?

- Can knowledge of the humanistic disciplines promote students' approach to IPE or is it more a matter of interest and/or personality?

- Why are not IPTW models/approaches spreading to other parts of the health systems.

- The concept “Team Player” is a tentative concept and its validity needs to be further elaborated upon in forthcoming research.
Bakgrund
Varje dag arbetar personal i interprofessionella team inom den svenska sjukvården för att öka patientkvaliteten. Idag måste de som arbetar i vården vara både professionella och interprofessionella för att kunna arbeta i dessa team. Men hur utbildar vårdutbildningarna i Sverige sina studenter för att dessa ska bli bra teamarbetare och hur skapar man interprofessionell kompetens bland studenterna. I min avhandling försöker jag att ge svar på dessa frågor med både ett teoretiskt och ett empiriskt angreppssätt.

Studie I
Studie II
I detta delarbete presenteras en metakognitiv modell om professionell kompetens och det professionella handlandet och hur man kan använda en sådan modell på tre olika nivåer individ, grupp och organisation. På individnivå diskuterar hur man kan träna studenter att tänka metakognitivt över sitt professionella handlande samt hur man i de små integrerade grupperna kan använda metakognitiva modeller för att få struktur i arbetet. Organisatoriskt är det också viktigt att tänka metakognitivt vid utformandet av interprofessionella läroplaner.

Studie III
Varje år genomförs en nationell utvärdering av samtliga läkarutbildningar i Sverige. En enkät med en sexgradig skala, skickas ut till alla läkare som tog examen ett år tidigare. Enkäten innehåller åtta frågor om hur utbildningen har förberett dem för; att arbeta som läkare, utvecklat sin förmåga till samarbete med andra professioner, utöva bra ledarskap, kommunicera med patienter, viljan till ett livslångt lärande, viljan att forska, förmågan att handlägga akut sjuka patienter samt att utöva förebyggande hälsovård. Under en femårsperiod (2000-2004) svarade 3534 läkare på enkäten med en svarsfrekvens på 85%. Resultatet visade att de läkare som hade haft en interprofessionell utbildningsplan i flera steg under sin utbildning, dvs Hälsouniversitetets läkarstudenter, i större utsträckning än läkarstudenterna från de andra svenska universiteten upplevde att utbildningen förberett dem för att arbeta tillsammans med andra professioner i vården (p=<0.0001). Däremot framkom ingen skillnad mellan läkarstudenterna när det gällde deras uppfattning om att handlägga akuta patienter. Detta kan tolkas som att trots att omfattande moment av interprofessionellt lärande finns i utbildningen vid Hälsouniversitetet, verkar inte detta negativt påverka den rent medicinska kompetensen för läkarstudenterna.

Studie IV
För att följa upp resultaten från delstudie III och även studera om liknande resultat framkom för sjuksköterskestudenter genomfördes en studie av tre olika sjuksköterskeutbildningar i mellersta Sverige. Studien byggde på samma enkät som för läkarutbildningen och genomfördes
även denna ett år efter avslutad sjuksköterskeutbildning. Av urvalet sjuksköterskestudenter från de tre lärosätena besvarade 55% (n=303 sjuksköterskor) enkäten. Resultaten visade att de som studerat vid universitetet med programintegration dvs Hälsouniversitetets sjuksköterskestudenter, upplevde att de i större utsträckning hade blivit förberedda för att arbeta tillsammans med andra professioner inom vården (p=<0.0001). Vidare rapporterade dessa sjuksköterskestudenter att de i högre utsträckning (p=0.003) upplevde att de var förberedda att arbeta inom sin profession och att de var mer förberedda (p=0.006) att kommunicera med patienter än sjuksköterskestudenter från de andra två lärosätena.

Studie V

Studenter från läkarutbildning respektive sjuksköterskeutbildning vid två universitet med olika interprofessionella kursplaner deltog i denna delstudie. På det ena universitetet hade studenterna två interprofessionella moment innan de påbörjade placeringen på den kliniska undervisningsavdelningen (IPTW) och på det andra universitetet saknades dessa interprofessionella moment innan IPTW. Studenterna fick besvara en enkät med mätinstrumentet ”Readiness for Interprofessional Learning Scale” (RIPLS). Både studenter som var tidigt respektive sent i sin utbildning deltog i studien. De båda universitetens läkar- och sjuksköterskestudenter ombads att fylla i enkäten första dagen av den nya terminen. Backgrundsfakta var bl. a. kön, ålder och tidigare arbetslivserfarenheter i vården. Resultaten visade att kvinnor i allmänhet och studenter på sjuksköterskeprogrammet var mer öppna för att arbeta tillsammans med andra professioner och till en viss del även de studenter som har genomgått en interprofessionell kursplan innan placering på den interprofessionella undervisningsavdelningen.

Konklusion

Både läkarstudenter och sjuksköterskestudenter som har haft en interprofessionell kursplan i flera steg under sin utbildning rapporterar att deras utbildning har förberett dem för att arbeta tillsammans med andra professioner inom vården. Kvinnor och sjuksköterskestudenter förefaller vara mest villiga att arbeta tillsammans med andra professioner. Vården idag och i framtiden kräver samarbete mellan olika
professioner för att effektivt kunna möta de krav och utmaningar som inte minst reflekteras av de demografiska och sociala förändringarna samhället genomgår. Detta får stor betydelse för hur utbildningen av våra vårdprofessioner ska planeras. Att vara professionell inom vården idag och i framtiden kommer att innebära att man även är interprofessionell.
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