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## **Education, Dentistry and Social work: Interactive and continuous assessment for development of professional competence**

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### **Abstract**

*This project uses assessment to develop students' professional competence during their studies for qualification as social workers, teachers and dentists in a culturally heterogeneous society. Difficulties of uniting theory and practise are solved through 'simulated' authentic situations. The students describe critical professional situations, which are also described by experts. The students compare their analysis and interpretations with those of the experts, in self-assessment, group discussion and examination. The students describe, analyse, act and compare, and then articulate their need to extend their competence. The project is a useful model to connect theory and practice. In essence the model is common, but adjusted to the different courses of study and the varying requirements of the professions.*

### **The Basis of the Project**

The project was to develop models to support students undertaking professional education in the areas of health, education and care in developing their professional competence. This takes place with the help of continuous assessment in simulated authentic situations. The project focuses on the following problems in professional education:

- a) The difficulty of uniting theory and practice into a whole in the courses of study
- b) The need to develop models for authentic professional situations, which are integrated into the courses of study
- c) The difficulty of forming a process of assessment that is relevant in relationship to the desired competence, and that does not only assess theoretical knowledge and technical skill
- d) The need to integrate assessment into the learning process
- e) The students' need to develop the ability to assess their own competence on a continuing basis.

Our courses of study need to improve in the following ways:

- a) Assessment of theoretical knowledge and of professional competence is often carried out separately. The two aspects are integrated all too seldom in assessment. Assessment is also carried out in totally different ways: Theoretical subjects are often assessed by means of written examinations with strict time limits, while professional competence is assessed using a longer process. The types of criteria used are different for the two assessments.

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- b) The students have too little influence over the assessments, both over the criteria and the assessment process itself. The assessment utilises too seldom the various forms of self-assessment and assessment by colleagues.
- c) The assessment does not cover adequately the ability to participate in and acquire knowledge together with others in a group. Models where the students themselves are able to assess the group's achievements - and their own - need to be developed.

In this respect it is important to define closely the conditions and requirements of the assessments. Where assessment criteria for model situations are to be used by a larger group, it is of great importance that they are communicable, clear and completely transparent. Where assessment of fellow students is concerned, it is important that this does not create a situation where the student has difficulty in keeping objective assessment and collegial loyalties separate. It is important not to assess in pairs but rather to rotate the assessments. Furthermore, it is important not to connect such assessment to final marks but to use student assessment at an earlier stage.

### **Professionals in a social culturally heterogeneous society**

What do dentists, social workers and teachers need to know in order to succeed in working in a culturally heterogeneous society? In addition to developing the competence within the subject field they need to improve their ability to act in situations where different kinds of citizenship are expressed contingent on time, contexts and reference groups. Every professional needs to reflect upon and be able to handle the fact that 'our norms are human and historical rather than immutable and eternal' (Nussbaum 1997, p.52).

Professionals working in care, education and health must be able to handle 'real life scenarios' which are connected to social, cultural and ethnic variation, as well as gender. The effect of globalisation has over the last decades created a new attention to politics concerning identity and citizenship (Giddens 1991). As Wenger (1998) points out, educational institutions are multifaceted organisms consisting of related interacting sub-communities. Concepts like 'periphery' and 'centre' (Giddens 1984, Giampapa 2004) will be adequate to use when analysing how students interact and negotiate their identities. The simulated examples of professional situations that the project intends to develop give just this sort of possibility. The courses we focus on are attended by many women, many students from families with no academic background, and relatively many students of differing ethnic background. The professions are 'socially embedded'. The meeting between the students, the profession and the course of study is problematic. One example is that half of the students who start teacher education in maths and sciences come from non-academic homes and express their insecurity about academic culture.

### **The Pedagogical Concept**

Professional education leading to professions within health, education and care constitute many of the courses offered by Malmö University. During their course of study, students are to develop professional competence, which is more than knowledge and skill. A professional uses knowledge to solve typical problems of the profession.

Social workers, teachers and dentists make quick decisions every day that can have serious consequences for the lives of others. Such decisions should be well founded on knowledge, but theoretical knowledge and technical skill do not seem to be enough. Efficient action demands the ability to differentiate important from unimportant factors and to choose adequate solutions, in accordance with the situation (Yeh, 2004).

Researchers such as Molander (1993) maintain that knowledge is to be found in action and that active professionals cannot articulate their knowledge. It has been said of teachers that their profession does not have a theoretical basis and that those active in the profession act on intuition (Gärdenfors, 2004). Social work is spoken of in the same terms. Payne (1997) says that social work is the result of eclectic choice – that is to say, the social worker combines ideas that have different theoretical and disciplinary origins. Seen in this way, the competence that the courses of study are to develop is not accessible to the student, who has to be able to articulate the knowledge. Others (Schön, 1987) consider that professionalism is characterised by continuous learning. The professional recognises what is unique in every situation and yet is able to apply general theories. To continually develop one's own 'theory of practice' is thus included in one's professional competence (Kvernbekk, 1999, Svingby, 1978). The competence that the professional social worker should have been assisted in developing within the framework of professional education can be summarised in the following points:

- Competence in cooperating with colleagues
- Competence in establishing a supportive relationship and a professional reception of people in vulnerable situations
- Competence in relation to the skill of discovering one's own failings and merits in social work, as well as being able to identify one's own need of increased knowledge
- Competence in relation to identifying and analysing social problems
- Competence in seeing the person in a holistic perspective
- Competence in making independent judgements

If part of professional competence cannot be articulated, this has the consequence that the student, while being able to observe professional activities during their work experience placements, is unable to access the underlying motivation and base of experience. The problem is then to discover how general knowledge is actually being used in the specific situation, and the risk is that the wrong conclusions are drawn. Malmberg (2006) analyses how students within professional education/teacher education use each other's comments and dialogues to develop individual and collective knowledge in an internet-based course.

With respect to teacher education, the Degree of Ordinance (the Higher Education Act, Chapter 1) emphasises that the student, amongst other things, will be able to

- Assess and evaluate pupils' learning and development/.../
- Independently and together with others plan, carry out, evaluate and develop teaching and other pedagogical activities, as well as participate in the leadership of these activities

- Make use of and systematise their own and others' experiences together with relevant results of research as the bases for the development of professional activities
- Use information technology in pedagogical development/.../

In the publication *On the road to the teaching profession – practice placement in teacher education* (Malmö University, 2003) the importance of the teacher's cooperation with others is emphasised. 'Collaboration with others demands the skill of assuming another person's perspective and relegating oneself to the background'. (pg 13)

There is a need to verbalise what it is that happens during action and the motivation that lies behind it. Josefson (1991) says that the course of education needs to bring forward good examples of practical action and make sure that the student understands these. This is necessary for the students to be able to use their theoretical knowledge in 'real life situations'. Many students, who demonstrate good theoretical understanding and technical skills, have problems when they are to use their knowledge. They fail to identify what is unique in each case and instead tend to look for generalised rules of thumb or tips. Some chose solutions in their practical work that are not consistent with the theories they say they have embraced. If the course of education is to bring forward professionals capable of reflection, the students must have the opportunity of practicing this (Yeh, 2004). Even if all professional education contains a certain amount of practice placement, they have limitations which make it difficult for the student truly to train in reflection in professional practice.

Methods of supporting students before, during and after their practice placements are needed to provide opportunities for trying different ways of acting, and seeing the differences and similarities between their own actions and those of the professionals around them. This support should also give the students the possibility of articulating theories 'quietly' and of developing the skill of continuously assessing one's own competence. Through the simulation of authentic examples, information technology can offer an alternative to 'real life practice'. Such examples can be 'frozen', attempted again and changed, which is not possible in 'real life'. The simulations should not be seen as some sort of simple answer pointing the way to the correct solutions. Instead, they can offer challenging situations which give the participants the opportunity to discuss the advantages and disadvantages of various alternatives.

This project is built on the idea that such examples can form the foundation of an integrated and continuous assessment process in the course of studies. Professionals in health, education and care services work in a constantly changing reality with contradictory tendencies with respect to social and cultural integration. The teacher, the social worker and those working in dentistry must in a sensitive way adapt the way they work to the shifting needs they meet in their professions. This is part of professional competence, where theoretical knowledge has been of little help. Simulated authentic situations give unique chances to try out the conditions for and the consequences of an action and give students the opportunity to learn how to act in new and unpredicted situations.

Unanimous research shows that assessment is just such a working means of developing courses of study and in influencing the students' learning (Chan and van Aalst, 2003). This refers to the assessment's authenticity, the meaning of the tasks, the aim of the assessments, the clarity of the goals, the possibilities of feedback, and the possibilities of influence, amongst other things. Assessment should be an integrated part of the teaching and learning process. We do not view assessment as simply a means of control over individual achievements or as the teacher's judgement of the students. Our starting point is that assessment is a continuous process in education that both students and teachers plan, have responsibility for and participate in, and that assessment is relevant to both the development of the individual and the common processes of the accumulation of knowledge.

Pintrich (2000) maintains that the skill of self-assessment can be said to form the nucleus of professional competence. One of the more critical aspects of 'professionalism' is the skill of leading professional activities based on lifelong learning. Lifelong learning is a perspective that is integrated into everyday practice. With his daily activities as his starting point, the professional is thus expected to be able to judge his own competence as well as his limitations, identify educative needs and plan his future learning. In this way it becomes possible to ensure continuity and an optimally professional way of working. This is fundamentally an active and constructive process where the participants themselves set goals and have control over their learning and development of knowledge. Students who have the opportunity of self-assessment take greater responsibility for their learning and their increased understanding of problem solving, and devote more time to reflection. As well as this, the skill of self-assessment itself improves with practice and with feedback (Ericson et al, 1997, Sluijsman et al, 1999).

A systematic literature review has recently been carried out at Umeå University (Sundström, 2006), where self-knowledge is identified as a key concept within professional education. Sundström distinguishes four aspects of self knowledge: the individual's perception of his own achievements in connection with future tasks; how the individual evaluates his competence in various areas; how self knowledge has been formed through experience and interpretation of the surroundings; and how one judges one's own ability to carry out specific tasks. Criteria for supervision, the response of friends, response of groups and response of supervisors are all shown to be effective ways of educating reflective professionals.

Earlier development work at the School of Dentistry in Malmö is a starting point here. A model for interactive examination, which contains simulated situations derived from the profession, has been developed and successfully applied. A simulation is a simplified form of an actual situation. The simulation is used above all in situations where it is too dangerous or too expensive to practice in real situations. Simulations can, however, also be used in other situations. The development and evaluation of the project 'The Interactive Examination 1998-2005', has together with a longitudinal research evaluation shown how through self assessment one can gain valuable insights in patterns of professional action. (Attström, Mattheos et al, 2006).

There are a few studies that show how simulation for developing professional competence in teachers, social workers and the like may be used. One study showed that

student teachers who studied simulated school situations had significantly better results than student teachers who had ordinary practice placements. The students improved their ability to put pedagogical decisions into practice, became better at reflecting over events in the classroom and could explain their actions (Metcalf, 1996). In one study by Yeh (2004), students working with simulated situations developed better self-knowledge than the control group. Albion and Gibson (1998) showed too that student teachers improved with the help of simulated situations. In Malmö, students assessed their own examinations in groups. The criteria were brought forward through discussion by teachers and students. Recorded discussions show that the students had difficulty in deepening the discussion in an authentic situation based on these criteria (Folkesson & Hartsmar, 2005).

In one study, where the aim was to develop dentistry students' skills in self-assessment, Mattheos (et al 2004) used modern technology. In an interactive examination, the students were trained to evaluate their own competence. The examination was based on simulated situations, where the student compared his own answer to the expert's, made comments on the differences and made suggestions for his own need for further education. Professional work encompasses a spectrum of situations from cases where specific knowledge is in focus, to those where many sorts of knowledge are brought to bear.

The cases used thus far in dentistry education reflect most strongly those aspects of the profession where specific competence is called for, rather than the multi-faceted meeting with the patient. This may imply situations creating conflicts between the professional considerations concerning what is regarded to be a good dental treatment and what from a cultural and/or religious standpoint is possible or impossible to undergo. In cases of the former type, the students' answer can usually be assessed as right or wrong. In the latter, however, there can be many different solutions. Students must develop their competence in dealing with both types of situations.

The results indicate that the simulation of authentic events can be an effective way of improving the students' ability to reflect in the professional context. The project therefore plans to carry out a continuous assessment process built on simulated authentic situations in three areas of professional education: education of teachers of mathematics and science, education of social workers and the education of dentists. A tool for computer-based simulation of professional situations has already been developed (Janda, 2005) where the experiences of development projects within education in dentistry have been used, but these need to be developed further. We need to find situations which in an adequate way represent all the demands of the profession. The concept means that during their practice placements students 'collect' situations that they find 'critical'. These are simulated. Events are also formulated by 'practice' and 'theory' teachers.

The simulated situations are used in self-assessment, group discussions and in examinations. In fact, the concept means that the students, in a successive process of assessment which includes both individual and collective elements:

- 1) collect, or alternatively, make a choice from a selection of professional situations, describe, analyse and decide/act,
- 2) compare their action in the situation with others',

- 3) articulate their need to develop their competence.

Within the university's different spheres there are a number of active development projects underway, in accordance with the Bologna process and with the concept of 'learning outcomes' in focus. The project, as we have planned it, clarifies the competence that the students in the different courses of study are expected to acquire. Different levels of points cannot be seen in themselves as signs of progress. The criteria for progression between foundation and advanced levels need to be tried and clarified further. One starting point for deciding on levels is the use of models for professional development, within the framework for professional education. Bernler and Johnsson (1986) describe the development of professional psycho-social work as a process *from action without understanding, understanding before action, to concurrent understanding and action*. The model builds on the students' gradual increase of consciousness of their actions so that they in their highest form do 'the right thing' and know why they are doing the right thing. We mean that clear 'learning outcomes' are important in order to promote mobility between the courses of education and professional work within and between countries.

### **The Organisation of the Project**

Three courses of study are included in the project, in a cooperative manner.

**The School of Education:** The project will include 200 students who are undertaking courses to become teachers of mathematics and science. Nanny Hartsmar and Claes Malmberg teach the courses, together with a number of other colleagues. Hartsmar is project leader and will coordinate the project. Hartsmar and Malmberg will, in addition to their normal teaching load, collect situations and organise workshops as noted above. The development project refers to the common 'General Education' (30 ECTS), 1<sup>st</sup> semester. During the 3<sup>rd</sup> semester in Year 2, the development project will include all students, but they will be divided into subjects of 15 ECTS each, relating professional competence to various theoretical content (for example, Mathematics for Younger Children, Sustainable Development, Algebra for the Senior High School). For students at the School of Education, the first semester is tremendously important. It encompasses a reorientation where one's own naive impressions of the profession are challenged. The transition to the 'real subject content' during the following semester is also decisive. This is where the profession's various sub parts are brought together. The main subjects within the teacher education – for example mathematics and teaching – contain both studies in the discipline and practice placement. From an assessment point of view, this means that consideration has to be taken of both the placement-based and campus-based results in determining an overall course result.

**School of Social Studies:** The subject: Pedagogy and Social Pedagogy, 30 ECTS, 4<sup>th</sup> semester of the course in social work with a social pedagogy specialisation. Mats Högström teaches the course together with Per-Axel Hallstedt. As well as the usual course content, Hallstedt and Högström will collect critical situations from teachers and professionals, and arrange workshops and student advisory teams. The semester will be directed towards the theoretical and practical learning of social pedagogic work. The students keep in contact with professional social teachers. The students collect

information on social pedagogy in practice through interviews and observations. The theory-based overview of social-pedagogic work is discussed with those active in the profession. During the project a number of model situations will be created, forming the groundwork for a series of role-plays. Typical as well as critical situations within the respective fields of work, common sequences or chains of events, basic as well as specific action and patterns of action amongst social workers will be described. Together, these form the cornerstone of the development project. They will be used in assessment situations where the way the role is played, as well as reflection over the way the role is played, becomes the object of assessment. The possibilities created by the simulation of model situations will be tested.

**The School of Dentistry:** The project intends to evaluate the progression in ability of dentistry students in making judgements of competence related to knowledge goals, skill-related goals and goals related to attitude. Devising methods of education that promote the transfer of knowledge and skills between different learning environments (base group, pre-clinic and clinic) is of particular importance. Students of dentistry in Malmö begin meeting patients with simple complaints at an early stage (the first year) in order to continuously develop their competence in preparedness for the care of patients with more complex problems. Self-assessment and assessment by colleagues with links back to the supervisor are methods of teaching that are used quite often. These methods of reflective learning are to be systematised, become goal-related and made accessible via an internet-based model. According to the curriculum for education in dentistry, a clear transference of competence between pre-clinic and clinic is expected between subjects 3 and 4, as well as between subjects 6 and 7. Evaluation of how the internet-based model contributes to the transfer of competence will therefore take place in these student groups. Nikolaos Mattheos has many years of experience in developing internet-based teaching and is responsible for the development of the model. As well as the people mentioned, the project will be actively supported by Docent Cecilia Christersson and Professor Gunilla Svingby.

### **Planning the project**

Year 1: The work is carried out according to the concept of the three courses of education. Three workshops are carried out – two with participants from the three courses of education (students, theory and practical teachers) – and one with external participants. Students from each course are invited to participate in planning, realisation and evaluation.

The students' organisation has also been consulted.

Year 2: The development work is carried out according to the concept. Two workshops are held for planning and exchange of experiences between students, teachers and professionals. A workshop with external participants is held for dissemination and feedback. Students from each course of study will participate in each workshop. They will be chosen by the students' organisation and will receive an entitlement. During the whole period of development, all students will be invited to several so-called student advisory teams at which experience of the project will be discussed.

For dissemination and exchange of experiences, two workshops are planned, as well as participation in three conferences, CiCe, ECER (EERA) and NFPF. The students and those responsible for practice placements who participate actively in planning, realisation and evaluation will be remunerated. A certain amount of pedagogical/technical consultation will be required.

### **Plan for Evaluation**

The project will use an established net-platform where the courses' structure, information and material will all be collected. The platform will also include forums for discussion and common work. All the documentation will be saved and searches will be carried out easily. Assessment with simulated situations will be presented via the platform. In that way, the students also have access to the assessment criteria, which are formed in discussions between teachers, students and professionals. The students can choose between different situations. The student's answers are registered and sent to the teacher. At the same time the student will receive back one or more answers from active professionals and from teachers. The student's comparisons, together with reflective comments on the need of further competence development are also registered. The grounds for the evaluation of the student's competence are therefore visible and open for discussion. Discussions between teachers, students and professionals about individual situations are saved as well, easily accessible on the platform. The results of the assessments are correlated, partly for all students and partly in relationship to particular groups. Each student will have access to an individual 'e-portfolio' where all efforts and contributions will be saved and easily searched through. The project will provide at least four opportunities for evaluation by students (and twice by teachers) by means of computer-based evaluation forms. A net-forum will be open for all participatory teachers, professionals and students. Questions related to evaluation will be continually discussed there. The second workshop during Year 2 will be devoted to a common evaluation of the project. A steering/evaluating group has been invited to attend, consisting of pro vice-chancellor Harriet Axelsson, Malmö University, prof. Sven-Axel Månsson Faculty of Health and Society, and prof. Alistair Ross, London Metropolitan University.

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