



Interprofessional Participation and Reflection in a Digital Network

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Abstract

Interdisciplinary professional education (IPE) contributes to the formation of effective collaboration in the field of practice. Education needs to be organised so that health science students can learn with, from, and about each other. This article explores how web-based collaboration contributes to this, by describing how it promotes reflection and professional understanding among health science students. Our data analysis is based on focus group interviews and online student discussions. The findings show that the flexibility of digital network, which represents both collaboration triggered by videos and online communication, is important for the students: they develop their argumentation together in reflective tranquillity. It is important to practise reflection since a choice of actions is an integral part of healthcare work, work which depends upon judgement exercised by the individual healthcare worker. The digital network allows students from different health science programmes to draw on each other's knowledge and expertise. The findings are relevant for the development of reflection and professional understanding among health science students, as they show how students discuss and seek solutions to complex challenges in the practice.

Keywords: Qualitative method, interprofessional education, web-based learning, reflection

Introduction

Increased professionalization and increased attention to patients with complex diseases have led to the requirement of different professions being able to collaborate across disciplinary boundaries (Mulvale & Bourgeault, 2007; Svensson, 1996). Collaboration is difficult because a profession, in principle, has a monopoly: only people with a certain education are entitled to exercise the profession in question, which, in practice, may be at the expense of general knowledge and sharing with other professionals. Professional competence is based upon science, is acquired through education, and has a practical and clearly defined goal. This requires both theoretical and practical knowledge in the subject.

Interprofessional education (IPE) is defined as occasions when two or more professions learn with, from and about each other to improve collaboration and the quality of care (Barr, Koppel, Reeves, Hammick, & Freeth, 2005). By organising the training, IPE can provide effective cooperation with other professions in the practice (Barr et al., 2005). Students who learn to collaborate with other students can provide better service to patients, because they develop the skill to reflect on collaborative processes with other professions (Wilhelmsson, Pelling, Ludvigsson, Dahlgren, Hammar, & Faresjö, 2009). Experiential learning requires reflection on the process, both individually and as a group. Schön (1987) divides the development of knowledge in action into two themes: reflection-in-action and reflection-on-action. Reflection-in-action means that practitioners think about their work while carrying it out and can adjust and improve it while the action is in progress. Reflection-on-action means that one can, in peace and quiet in the aftermath of the situation, revise the events and one's own actions. One reflects on what has been done to whether the knowledge influenced the result. Schön is concerned with the fact that knowledge cannot be separated from social practice.

IPE involves learning, while learning, in turn, requires reflection. Students should learn to reflect on their own profession as opposed to other profession, and thereby discover the specific features of their own profession. Reflection is often quoted as a key ingredient as being crucial to effective IPE and practice (Barr et al, 2005; D'Eon, 2005). A common expression of reflection includes "stepping or sitting back" from a situation to review it. The process is described as consisting of the turning over of a subject in one's mind and giving it serious thought (Dewey, 1933). Rodgers (2002) suggests that reflection is the process of the "reconstruction and reorganization of experience which adds to the meaning of experience". Just as situations must be interpreted in order to be handled in an appropriate manner, so too a written text has to be read and interpreted before the words can make sense.

The national curriculum for professional education in health and social care in Norway describes a course whose goal is to develop a common frame of reference as a basis for future interprofessional collaborations. The topics comprise ethics, communication, state- and municipal-knowledge, health- and social-politics, as well as scientific theory and research methods. This article examines how health science students, participating in an interprofessional web-based curriculum, collaborated. First-year students from northern Norway who were enrolled in four educational programs (dental hygiene, occupational therapy, physiotherapy, and radiography) took part in the study. The study explores students' online discussions relating to five filmed, authentic healthcare cases. The purpose is to show how participation in a digital network can promote professional understanding and reflection among health science students when collaborating using online communication.

Methods

The study presents findings from a qualitative study of a web-based curriculum where students from four different health science programs participated (Nilsen, 2012).

Study design

Two groups of six students from different health science programs were selected to follow a web-based variant of the course. The supervisor for the two groups was responsible for developing the programme. The students followed a succession of presentation pages on a learning path, and a new page was presented every day. The purpose of the programme was to challenge the students to reflect and encourage discussions by adding new tasks every day. The participants were given five authentic healthcare cases. These were filmed with drama students as actors in order to show how traditional collaboration between healthcare professionals could be. The students participated in five online discussions, one per case. For each situation, there were one or two lectures of 10–15 minutes in length. By following the lectures and reading the literature for each topic, the students should have had sufficient grounds to take part in the online discussions.

Data collection

Two methods of data collection were used: textual analysis of transcripts of the online discussions (Nord, 1991) and focus group interviews (Vaughn, Schumm, & Sinagub, 1996). The students were divided into two distinct groups, forming two focus groups of six people. Group 1 consisted of a radiography student, an occupational therapy student, two physiotherapy students, and two dental hygiene students. Group 2 consisted of two radiography students and four physiotherapy students. It was coincidental that no medical laboratory medicine students were in the sample. Since interprofessional education was explored, rather than the similarities/differences between the professions, this was not deemed to be a weakness of the method.

Data analyses

The online discussions were transcribed, systematically reviewed, and analysed (Nord, 1991). In the analysis, excerpts that included specific examples of students from different programmes were selected in order to share their knowledge and experiences with each other. For this article, three excerpts from the online discussions relating to the two cases, *The Good Encounter* (Figure 1) and *The Role of the Healthcare Worker* (Figure 2), were selected. Excerpts from the online discussion from the case *The Good Encounter* are presented in Excerpt 1, whereas those from the case *The Healthcare Worker's Role* are presented in Excerpts 2 and 3. These particular extracts were chosen because they illustrate how web-based collaboration can be used for students to share knowledge and reflect on practice together. The content of the online discussions was analysed (Silverman, 2006) and spontaneous expressions and their reflections on the material were noted and interpreted. The text was read several times to create a holistic understanding (Geanellos, 2000). The empirical analysis focused on student participation in the digital network and opportunity for reflection when discussing online (Schön, 1987).

To complete the statement from the online discussions, the students were then interviewed. Two focus group interviews, guided by the first author, were conducted, one per group. A combination of open and closed questions was used in the interviews; the answers were followed up and elaborated. The interviews were audio-taped and transcribed (Vaughn et al., 1996). Four

statements from the focus group interviews form the basis of the textual analysis (Excerpt 4). These are considered to be key statements highlighting the students' experience of participating in discussions in a digital community of practice. The online discussions and focus group interviews are presented in different formats. The online discussions show excerpts from situations with students from different healthcare programmes. The results from the focus group interviews are presented as statements. They are in response to the question of the students' experience of discussing online. Together, the use of textual analysis of transcripts of the online discussions and focus group interviews reflects how videos and written online communication fosters collaboration and reflection among health science students.

Results

Interaction in online discussions

The Good Encounter (Figure 1) is a film depicting a “radiography student” and a “radiologist”.



Figure 1. From the case *The Good Encounter*.

Excerpt 1 is the online discussion between a physiotherapy student, a radiography student, and a dental hygiene student regarding a similar situation.

Excerpt 1. Sharing professional knowledge

Physiotherapy student: (...) Because of the radiologist, the student became increasingly insecure during the conversation; she finds an equal partner, which allows for good teamwork in the communication. For example, the radiologist moves to the same height as the student when he sits down; hence, she avoids looking down at him, but makes sure they are equal, and the conversation continues satisfactorily. Since it is the radiologist who has the formal power in the form of her position, it is her task to make this an equal relationship between her and the student, and I think she succeeds in this. Radiography student: I think it is well pointed out that she sits down when the student does, so as not to look down on him. I also think that her ability to communicate well makes the student feel that he can safely turn to her later on.

Dental hygiene student: I think communication between the radiologist and radiography student was pretty straightforward. They listen to each other, and the student will, in the future, learn from his mistakes. There was also a great conversation at the end where they sat down together and talked in a friendly manner.

The physiotherapy student exemplifies an attempt to level the inequality in the relationship between two healthcare workers by reducing the physical asymmetry. The excerpt illustrates how health science students from different programs draw upon each other's knowledge and expertise. Both the radiography student and the dental hygiene student agreed with the physiotherapy student's description that a beneficial situation for communication between the healthcare professionals had been created.

The Healthcare Worker's Role (Figure 2) is a film depicting a "doctor" and a "nurse" discussing the organisation and division of duties in health- and social-services.



Figure 2. From the case *The Healthcare Worker's Role*.

Excerpt 2 is a discussion between an occupational therapy student and a physiotherapy student, discussing various roles in healthcare.

Excerpt 2. Professions and the different roles in the health services

Occupational therapy student: I was lucky enough to experience teamwork during my practice. It was a user who had CP, and an electric wheelchair had to be adapted. Two physiotherapists, an occupational therapist, and a wheelchair technician, as well as the guardians were present so I had the opportunity to see how they worked together in a team, and role played by the occupational therapist in relation to the physiotherapists. To be honest, I was surprised how similarly these two occupational groups worked during the actual meeting. In fact, the occupational therapist was more active than the physiotherapists on the medical side in relation to correct posture. Here, anatomical knowledge plays a part, and this comprises a major element in the profession of occupational therapy. Of the cases I had access to, it was the occupational

therapist who was responsible for reporting and further treatment. In my opinion, it was an exciting observation.

Physiotherapy student: Oh, how exciting! Yes, in that case it was perhaps the occupational therapist that had the main task. The occupational therapist, for example, adapts equipment, and is probably better at it than physiotherapists. Physiotherapists places greater weight on identifying, and improve or sustain the patient's functioning.

The occupational therapy student examines a situation she has experienced from her practice, in which she describes a team effort and the role of the occupational therapist in that team. She describes being surprised to see the similarity in the work of the occupational therapist and physiotherapists. She points out the importance of the occupational therapist's knowledge of anatomy and claims that the occupational therapist was responsible for the reports and further treatment. The physiotherapy student says enthusiastically that it was an interesting observation, but believes that the occupational therapy student's experience is a special case. The physiotherapy student outlines a general division of work between the occupational therapists and physiotherapists in practice. The excerpt illustrates health science students' reflections on knowledge and skills in an interprofessional team, based upon the discussion of various tasks of the professions in the team.

Excerpt 3 illustrates the students' discussion about their practical strengths and weaknesses based on *The Healthcare Worker's Role*.

Excerpt 3. Reflection on practice

Physiotherapy student: I have also noticed one thing. I simply feel a bit stupid at times. (...) Yet, there is an advantage in not being expected to know everything your mentor knows. Hence, you will be given more understanding, and you get a lot of good advice that can help you further in your studies. Dental hygiene student: I totally agree with what you say about feeling stupid sometimes. As a reasonably young student, it is not always easy to "swallow the big spoon of knowledge". Fortunately, there are many good mentors out there who understand how we feel, as they themselves were once in a similar position.

Radiography student: I totally agree. It is easy to be overlooked as a student (...). If we see one of the professional healthcare workers making an obvious mistake, you are likely to be disregarded because you are "merely" a student. The positive thing about being in practice is that you learn in different ways. (...) At least that is how it is for me; I learn better by doing things rather than sitting and listening to a lecture. Of course, there are things you cannot do, and thus must be read!

The physiotherapy student says that she sometimes feels stupid in practice, but usually the expectations for students in practice are lower. She also states that good guidance leads students on in their studies. The dental hygiene student and radiography student agree, and share ways of thinking, speaking, and acting (Wenger, 1998). The radiography student says that it is easy to be overlooked as a student and that it is better to learn in practice than to listen to a lecture.

Interviews about online discussions

In order to explore our analysis and interpretation of the excerpts, the students were asked how they perceived the online discussions. Four statements were selected for analysis, presented in Excerpt 4. The statements illustrate experiences with written online dialogue, thereby allowing beneficial opportunities for reflection. The focus is on the students' experience in participating in discussions online.

Excerpt 4. Statements about participation in online discussions

1: I thought it was alright, because I got to read through and sort out what people had written and post a comment instead. It is a bit easier to read and discuss online, because you can reflect on what to write. Yes, I don't know, I think it was much better to write online.

2: (...) Being online I thought it worked quite well, and in the discussion forums we learned a lot. You can go back to look at what we discussed, unravelling some of the topics of the discussions.

3: There were so many differences, people had emphasised different things. (...) you could sort of compare, you learned a lot better and had a broader view. At the same time, you had it in front of you, so you could scroll back to see, "What did she mean? What was it he said?" In that sense, it really is a good way to keep up with the discussion and perhaps learn to join in.

4: Yes, once again, I agree. The fact was that you got a great overview of what had been said before, and we could discuss by reviewing as well.

A student says (1) that the technology helps to promote reflection, because it is easier to discuss in writing than verbally (Vetlesen, 2003). She justifies it by saying that she has time to sort through and read what the others have written and think about what to write. The excerpt highlights what reflection-on-action means by re-evaluating the interactions in peace and quiet in the aftermath of the situation (Schön, 1987). Different ideas were emphasised in the discussion, and these gave a broader perspective and greater learning outcomes (3). The student says that being able to go back track and see what the others had said was very beneficial. Another student agrees, pointing out the opportunity to go back to previous posted comments (4).

Discussion

This article explores how the digital network promotes professional understanding and reflection among health science students triggered by videos and written online communication. In the course of three excerpts from online discussions, and additional excerpt of statements from the interviews with the students, the analysis explores how students from different health science professions reflect on practice and draw on each other's knowledge and expertise. Physiotherapy students, during their education, acquire tools for describing, analysing, and interpreting the body and its movements in different ways. Excerpt 1 illustrates how a physiotherapy student shares professional knowledge with other students, thereby showing how students from different backgrounds and perspectives draw upon each other's knowledge and expertise (Parsell, Spalding, & Bligh, 1998). Since our understanding of the world is a continuous process in which our previous understanding is adjusted

or modified in light of new experiences (Säljö, 1998), new requirements are established through our experiences, while being subject to reflection and revision in the face of this new experience. This provides the students access to new knowledge and new frameworks of understanding (Säljö, 1998). Thus, Excerpt 2 illustrates a dialogue in which the students express different views on the tasks of healthcare workers. In Excerpt 3, the students' reflections on practice are presented, illustrating that there are common ways in which students think, act, and speak (Schön, 1987).

In the focus group interviews (Excerpt 4), the students say that discussion online made it easier to acquire an overview because they could review the discussion to see what had been written earlier. They were then able to reflect on what had been written and post new comments (Holmes, & Gardner, 2006)). Writing is a good way to develop reflection (Eisner, 1991). The online discussions lasted several hours, and the timescale ranged from virtually synchronous to varying degrees of lag-time. Asynchronous tools promote reflection to a greater extent than do synchronous tools (Benbunan-Fich & Hiltz, 1999). The excerpts illustrate how written online dialogue provides students with the opportunity to develop their argument in reflective tranquillity. For the students, reflection means that they have to think through the situation. Reflection is an important part of collaborative learning for health science students; however, it requires a structure ensuring that students have the space and time to be able to reflect (Clark, 2009). The goal is to develop collaborative learning environments that encourage reflection and professional understanding where students learn with, from, and about each other (Barr et al., 2005).

The analysis illustrates how students from different health science programmes share knowledge through different learning processes. It is important that students are able to understand the value, functions, and roles of other professions; furthermore they should possess interprofessional skills (Wilhelmsson, 2009). The discussion regarding the authentic case studies gave them the opportunity to focus on personal and interactive skills in relational work, which is important for practice and also stimulates to remember their own experiences. The discussions around the cases encouraged the students' reflection-on-action (Schön, 1987). The different perspectives in the cases challenged the students and resulted in creative and stimulating thinking and increased insight. The students reflected on their own roles as health science students and the particular nature of other professions too. Thus, they discovered their strengths and skills thereby allowing them to complement each other's expertise. Therefore, they had a common point of departure for practice. Although there are differences between professions, training in reflection is important because healthcare often necessitates a choice of action and is dependent upon the individual healthcare worker's judgment in practice.

Yet research on reflection in online discussions is divergent. Miers, Clarke, Pollard, Rickaby, Thomas et al. (2007) found that although students shared their knowledge online, their discussions were superficial and limited, showing little reflection and analytical ability. Atack, Parker, Rocchi, Maher & Dryden, (2009) describe how students from a range of programs such as nursing, medicine, paramedicine, police, media, and health administration discussed a simulated disaster situation in a web-based course, which increased the students' awareness and appreciation of other team members. Solomon, Baptiste, Hall, Luke, Orchard et al. (2010) describe how students from different institutions participated in an online discussion forum where the use of problem-based learning (PBL) was intended to encourage interaction. The results showed that students learned about each other's roles, solved problems together, and had a positive attitude towards web-based IPE.

This paper examines how participation in a digital network can promote reflection and understanding among students. Unlike Miers et al. (2007) who says that even if students share knowledge online the discussions is limited and show little reflection and analytical ability, the results from this study show that the web-based education helps the students feel that they are being given an opportunity for professional reflection and knowledge development. Although the limited number of participants in this study, our findings shows that digital networks provide health science students with training in collaborative reflection and increased understanding of each other's competence. This is relevant for the development of professional understanding among health science students, because it shows how students discuss and seek solutions to complex healthcare challenges. Our findings differ somewhat Solomon et al. (2010) who found that students learned about each other's roles, solved problems together, and had a positive attitude towards web-based IPE, since they were using problem based learning as approach to learning. As compared to Atack et al. (2009) who describe that participation in a web-based course increased the students' appreciation of other members in the team; however, in that study, the teams had participation of students from police, media, and health administration programs as well.

The primary focus of this study is reflection and professional understanding as a basis for IPE. Virtual communities of practice (VCoPs) are a type of online learning community that has been shown to improve knowledge sharing and thus overcome professional and structural isolation (R'ios, Aguilera & Guerrero, 2009; Wenger, McDermott & Snyder, 2002). The value of VCoPs is to communicate people who want to share or learn about a specific topic by interacting on an ongoing basis (Wenger, 2009). The main driver has been to create networks of people with common interests who are geographically dispersed. The technology helps to expand physical space as an arena for learning, while allowing the creation of a learning community, and providing new opportunities for interaction. This study shows professional understanding and reflection among health science students when they collaborate using online communication. Many educational institutions use different forms of web-based learning to motivate students to interact and work towards common goals. According to Wenger (2009) the question is is no longer whether this manner of teaching is "as good" as face-to-face learning. The searchlight is now trained on the factors affecting group dynamics and cooperative learning.

Concluding comments

It is important to find beneficial digital forms of cooperation, while maintaining and developing the specific expertise of the healthcare student. Discussing authentic cases stimulates students to remember their own experiences and is a potentially useful tool for IPE. Web-based education is a strategic tool for ensuring good and equitable health services and should be included early in the educational curriculum. By taking advantage of having resource to the network's functionality, health science students are given the opportunity to participate in online discussions with other students, regardless of whether they are on the campus or not. This can help enhance the quality of skills as well as the standardisation of health services, while allowing more time for the treatment of the patient.

However, to develop good occupationally-oriented practice it is necessary to conduct research focusing on the value of interprofessional collaborative education. Web-based education is one way of achieving this.

References

- Atack, L., Parker, K., Rocchi, M., Maher, J., & Dryden, T. (2009). The impact of an online interprofessional course in disaster management competency and attitude towards interprofessional learning. *Journal of Interprofessional Care*, 23(6), 586–598.
- Barr, H., Koppel, I., Reeves, S., Hammick, M., & Freeth, D. (2005). *Effective interprofessional education. Argument, assumption & evidence*. London: Blackwell.
- Benbunan-Fich, R., & Hiltz, S. R. (1999). Educational applications of CMCS: Solving case studies through asynchronous learning networks. *Journal of Computer-Mediated Communication*, 4(3). Retrieved from <http://onlinelibrary.wiley.com/doi/10.1111/jcmc.1999.4.issue-3/issuetoc>
- Clark, P. G. (2009). Reflecting on reflection in interprofessional education: Implication for theory and practice. *Journal of Interprofessional Care*, 23(3), 577–589.
- D`Eon, M. (2005). A blueprint for interprofessional learning. *Journal of Interprofessional Care*; 19 (Suppl. 1) 49–59.
- Dewey, J. (1933). *How we think* (Revised Edition). D. C. Heath, Boston.
- Geanellos, R. (2000). Exploring Ricoeur's hermeneutic theory of interpretation as a method of analysing research texts. *Nursing Inquiry*, 7, 112–119.
- Holmes, B., & Gardner, J. (2006). *e-learning. Concept and practice*. London: SAGE.
- Eisner, E. W. (1991). *The enlightened eye: Qualitative inquiry and the enhancement of educational practice*. New York: Macmillan.
- Miers, M. E., Clarke, B. A., Pollard, K. C., Rickaby, C. E., Thomas, J., & Turtle, A. (2007). Online interprofessional learning: The student experience. *Journal of Interprofessional Care*, 21(5), 529–542.12.
- Mulvale, G., & Bourgeault, I. (2007). Finding the right mix: How do contextual factors affect collaborative healthcare in Ontario? *Canadian Public Policy*, 33(7), 49–64.
- Nilsen, R. (2012). Digital Network as a learning Tool for Health Sciences Students; *Seminar.net*: Vol. 8 - Issue 2 2012 - ISSN 1504-4831.
- Nord, C. (1991). *Text analysis in translation: Theory, methodology, and didactic application of a model for translation-oriented text analysis*. Amsterdam, Netherlands/Atlanta, GA: Rodopi.
- Parsell, G., Spalding, R., & Bligh, J. (1998). Shared goals, shared learning: Evaluation of a multiprofessional course for undergraduate students. *Medical Education*, 32, 304-311.
- R´ios, S., Aguilera, F., Guerrero, L. (2009). Virtual communities of practices purpose evolution analysis using a Concept-Based mining approach. In: *Knowledge-Based and Intelligent Information and Engineering Systems*, pp. 480–489.
- Rodgers, C. (2002). Defining reflection: Another look at John Dewey and reflective thinking. *Teachers College Record*; 104: 842–866
- Silverman, D. (2006). *Interpreting qualitative data*. London: SAGE.
- Schön, D. A. (1987). *Educating the reflective practitioner – Toward a new design for teaching and learning in the professions*. London, England: Jossey-Bass.

- Solomon, S., Baptiste, S., Hall, P., Luke, R., Orchard, C., Rukholm, E. & Damiani-Taraba, G. (2010). Students' perceptions of interprofessional learning through facilitated online learning modules. *Medical Teacher*, 32, 384–391.
- Svensson, R. (1996). The interplay between doctors and nurses – A negotiated order perspective. *Sociology of Health and Illness*, 18(3), 379–398.
- Säljö, R. (1998). *Thinking with and through artifacts: The role of psychological tools and physical artifacts in human learning and cognition*. In Faulkner, D., Littleton, K., &
- Vaughn, S., Schumm, J. S., & Sinagub, J. (1996). *Focus group interviews in education and psychology*. California: SAGE.
- Vetlesen, A. J. (2003). Det forpliktende møtet. In Fritze, Y., Haugsbakk, G., & Nordkvelle, Y. (Eds.), *Dialog og nærhet*. Kristiansand: Høyskoleforlaget.
- Wenger, E. (1998). *Communities of practice: Learning, meaning, and identity*. Cambridge: Cambridge University Press.
- Wenger, E., McDermott, R.A., Snyder, W. (2002). *Cultivating communities of practice*. Harvard Business Press, Boston.
- Wilhelmsson, M., Pelling, S., Ludvigsson, J., Dahlgren, L.O., Hammar, M., & Faresjö, T. (2009). Twenty years' experience of interprofessional education in Linköping – Ground breaking and sustainable. *Journal of Interprofessional Care*, 23 (2), 1–13.