

Towards a framework for designing ICT-support for reflective learning activities in competency-based, multiprofessional education

I.I. Zitter MSc MTD¹, Prof Dr P.R.J. Simons¹, Prof Dr Th. J. ten Cate², Drs T.J. van Weert³

¹Centre for ICT in Education, Utrecht University, ²University Medical Center Utrecht, School of Medical Sciences, Onderwijsinstituut, ³The University of Professional Education Utrecht, Research Group ICT and Higher Education

i.i.zitter@ivlos.uu.nl, p.r.j.simons@ivlos.uu.nl, T.J.tencate@med.uu.nl, tom.vanweert@hvu.nl

BACKGROUND AND GOALS OF THE STUDY

ProfessionalsP are increasingly confronted with situations which require them to cooperate with professionals from different backgrounds to reach optimal results. Multiprofessional situations place serious demands on cooperative abilities. Educational institutes struggle with how to prepare students for the demands of future professions.

The research aims to result in 'design knowledge, i.e. knowledge that can be used in designing solutions to problems in the field in question' (Aken, 2004), in the form of a framework. The framework is expected to be usable for educational designers or teachers with experience in educational design. It should be suitable to assess and/or design effective ICT-support for competency-based, multiprofessional education. It is not the aim to design 'The Ideal ICT-Support'. The aim is to find guidelines which apply to ICT-support which effectively supportss learning activities in the above education. With these guidelines, (re)designing different kinds of ICT-solutions should be possible. The main research-question is: *'How can effective ICT-support be designed, which will invite students to reflect explicitly during their learning activities in a competency-based, multiprofessional educational setting?'*

Below, the proposed framework is visualised and discussed.

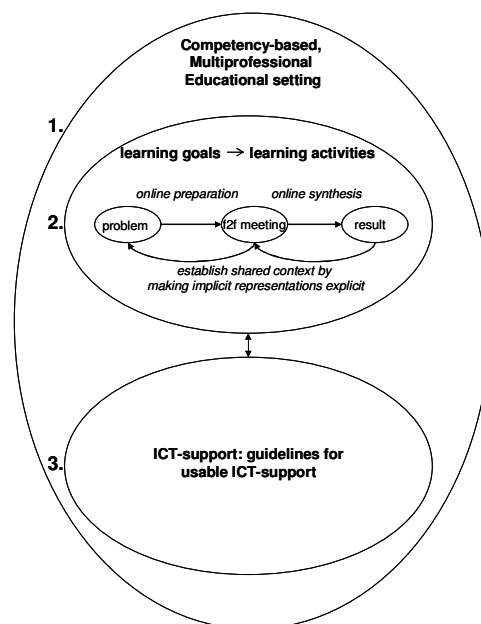


Figure 1: Proposed framework

1. Educational setting

The outer ellipse is the educational setting, which aims to develop the competencies needed to work in multiprofessional situations. In literature, terms like 'multiprofessional' and 'interprofessional' occur. The term 'profession' is preferable to 'discipline' since it means 'line of work', instead of 'discipline', which could also be used for different domains *within* a single profession (Bolhuis, 2002). There is no consensus on use of 'multi' or 'inter', a choice was made for 'multi', simply meaning two or more.

'Professional' is defined as followed: 'a professional works continuously at improving his/her vision, methodology, tools and techniques by (1) elaborating on his or her work-competencies by learning from and in practice (elaboration), (2) expanding his theoretical knowledge and insights by learning explicitly from and in research (expansion) and (3) externalising his practical and theoretical insights, which means contributing to the development of the profession (externalisation) and/or to team and organisational learning' (Simons & Ruijters, 2004).

2. Learning activities

We believe *reflection* on one's perspectives and the perspectives of others will help professionals from different backgrounds to connect. Explicit reflection may help to make implicit representations explicit. Explicit, external representations help to establish a *shared context* (Ostwald in (Alpay, 1998)).

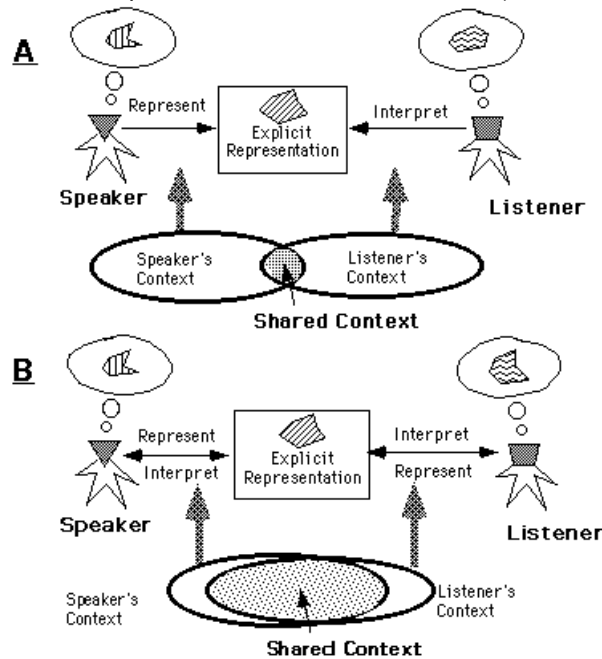


Figure 2: (Ostwald, 1996)

Reflection during the following learning activities will be researched:

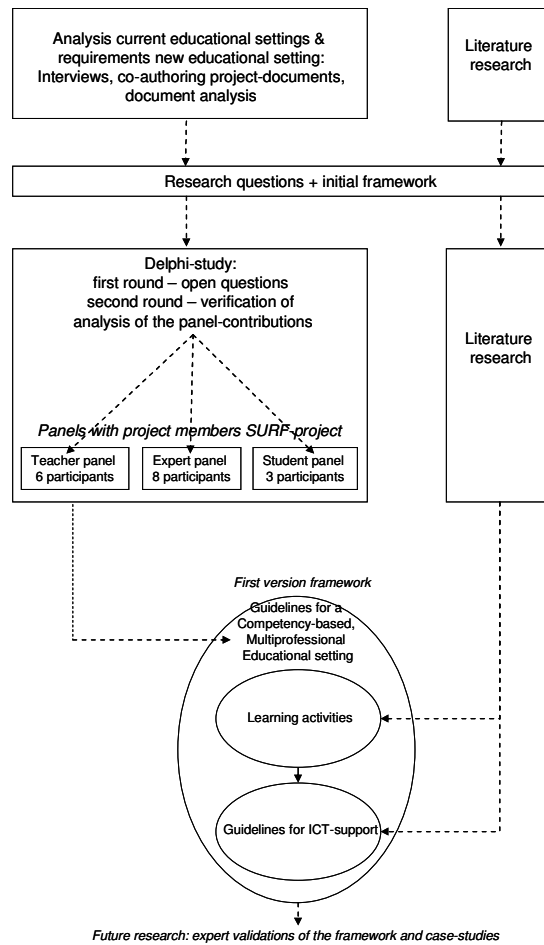
- Online preparation of a problem, leading to making implicit representations explicit; aiming to go from situation A to situation B (figure 2).
- Face-to-face meeting(s).
- Online synthesis of intermediary results, leading to explicit individual and team results; again to establish shared context, as shown in situation B.

3. ICT-support

We believe well-designed ICT-support will persuade students to reflect explicitly on their own perspectives and on the perspectives of students from other professional backgrounds, leading to making implicit representations explicit. ICT can support this process: the representations can be made explicit, commented on, discussed, refined, shared, saved etc.

RESEARCH DESIGN

The research design is visualised below.



Figuur 3: Research design

A Delphi-study was carried out in the context of a two-year SURF-project¹ 'Multiprofessional learning with ICT'. This project takes place in the Health Care domain with the following participating parties: Nursing, Physiotherapy and Logopaedics Programmes of the Faculty of Health Care (HvU) and SUMMA, School for Utrecht Medical Masters (UMCU).

'Delphi may be characterized as a method for structuring a group communication process so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem' (Linstone & Turoff, 2002). The Delphi was carried out with panels of project-members of the SURF-project: a teacher panel (6 teachers with experience in educational design), an expert panel (8 educational experts) and 3 students.

Prior to the Delphi, the following activities were carried out to analyse the current educational settings and requirements for new multiprofessional, competency-based educational settings: interviews with SURF-project members, document analysis of existing educational plans and co-authoring of project-documents during the starting phase of the project.

Besides, literature research was carried out, mainly to find input for the framework.

¹ SURF is the higher education and research partnership organisation for network services and information and communications technology.

RESULTS

On the basis of the preliminary research and literature research, an initial version of the proposed framework was made.

For the outer ellipse, a model of Rowlands and Adams (Rowland & Adams, 1999), which can be used to (re)design educational settings, was chosen. This model consists of seven main questions, which are related to each other. Each relation also results in a question. Answering these questions will help to (re)design a consistent educational setting. The seven main questions are:

1. Problem situation: Why? (in terms of larger performance system)
2. Goal: Why? (in terms of instructional system itself)
3. Learners: Who?
4. Content: What?
5. Instructional Setting: When and where?
6. Instructional Method: How?
7. Assessment: How well?

The Delphi-study was used to find guidelines for the outer ellipse, the panels were asked to answer above questions (which included explanation and examples). The contributions of the panels were analysed and summarised into 19 guidelines ordered according to the above model. Consequently, the guidelines were assessed by the panels. Below a summary of a guideline is shown as an example.

5. Instructional Setting			
	5.2 ICT to support communication and cooperation		
	Problem	Solution	Result
	Early acquaintance with one's profession is an important feature of competency-based education. Real-life professionals could play an important role during learning activities. However, the available time of professionals from the field is often scarce.	ICT could facilitate the communication between students and real-life professionals.	A selection of feasible types of ICT which facilitate the communication and cooperation is made; These are deployed functionally in the education in question.
	Relevant quote from the panel-contributions:	'It is important that students are able to consult professionals from the field'	

In addition to the above, guidelines to (re)design usable ICT-support were collected from literature. Future research will include case studies, before that, expert validations, which will be used to evaluate the framework.

REFERENCES

- Aken, J. E. (2004). Management Research Based on the Paradigm of the Design Sciences: The Quest for Field-Tested and Grounded Technological Rules. *Journal of Management Studies*, 41, 219-246.
- Alpay, L., Giboin, A. & Dieng, R. (1998). Accidentology: An Example of Problem Solving by Multiple Agents with Multiple Representations. In v. M. Someren, P. Reimann et al. (Eds.) *Learning with Multiple Representations* (pp. 152-174).
- Bolhuis, S. (2002). *Multiprofessioneel samenwerken in de gezondheidszorg. Onderzoek naar educatieve interventies*. Nijmegen: Onderwijsinstituut UMC St. Radboud Afdeling Onderwijsontwikkeling en Onderzoek.
- Linstone, H. & Turoff, M. (2002). *The Delphi Method: Techniques and Applications*. Information Systems Department at the New Jersey Institute of Technology.
- Ostwald, J. (1996). *Knowledge Construction in Software Development. The Evolving Artifact Approach*.
- Rowland, G. & Adams, A. (1999). Systems Thinking in Instructional Design. In J. Akker, van den, G. Branch, K.R.M. et al. (Eds.) *Design Approaches and Tools in Education and Training* (pp. 29-44). ico, Kluwer Academic Publishers.
- Simons, P. & Ruijters, M. (2004). Learning professionals: towards an integrated model. In H. Boshuizen, R. Bromme et al. (Eds.) *EARLI book* (pp. 207-229). Kluwer Academic Publishers.