

Students' Conceptions of Development Work as Promoting Professional Growth

Outi Mäkitalo^{1*}, Annikki Savolainen², Eeva Liikanen³, Riitta Lumme⁴, Annikki Railio⁴

¹*Degree Programme in Biomedical Laboratory Science*

²*Head of Department, Oulu University of Applied Sciences*

³*Department of Health Sciences, University of Oulu*

⁴*Metropolia University of Applied Sciences, Finland*

The aim of this study is to evaluate how students experience development work in point-of-care testing (POCT) as part of a specialist e-learning course in POCT provided jointly by the Finnish Universities of Applied Sciences (UAS). Students were required to implement development in actual workplaces, and to publish their work as a journal article. Data for the study were collected from 20 students via an open enquiry circulated by e-mail and analysed using a phenomenographic approach.

The results show that development work provided a functional tool to achieve professional growth and new relationships within the workplace. The main challenges in the future are to create closer links between the UAS and the workplace to support learning and create new learning environments for students.

Key words: *conception, development work, point-of-care testing, professional growth*

Introduction

The Universities of Applied Sciences in Finland are part of the national and international higher education community, with a special emphasis on developing expertise in the workplace. UAS form close links with workplaces in order to develop practice-based knowledge and respond to the changing demands of professional expertise and requirements for individual professional growth. UAS aim to educate and train experts who are able to transfer their professional knowledge and skills to the ever changing needs of the workplace [1]. As a result of this role, UAS could be described as an integral part of the world of work.

POCT, a rapidly expanding field in which analytical tests are carried out for patients outside the usual laboratory setting, was identified by UAS as an area of increasing demand for professional expertise. POCT is

significant both in relation to its major contribution to laboratory costs [2] and to patient safety. Demand for the development of competence in this area is demonstrated by the national recommendation for POCT in Finland, published in November 2009 [3]. New requirements for quality and competence in POCT are also set out in International Standard ISO 22870:2006. The Association of Biomedical Laboratory Scientists [4] designates POCT as an area of specialisation, while the European Association for Professions in Biomedical Laboratory Science states that patient safety and quality assurance are best addressed by virtue of a multi-disciplinary system [5].

In response, five UAS in Finland developed a joint specialist studies programme in POCT aimed at biomedical laboratory scientists. The 30 credit course was delivered by e-learning [6], a method which has benefits for health professionals [7-9]. All the students had access through employment to a local and national workplace context for their learning environment.

Received: November 16, 2010 Accepted: February 28, 2011

Corresponding author : Dr. Outi Mäkitalo, Head of Degree Programme in Biomedical Laboratory Science, Oulu University of Applied Sciences, PhD, Lecturer, Professorintie 5, 90220 Oulu, Finland
Tel. +35810 2722815 Fax. +3588 312 7300 outi.makitalo@oamk.fi,

Participating in the development of POCT at a regional level was an integral part of the programme, intended both to facilitate professional growth and to fulfil UAS' role of promoting the regional and national employment sector. The 12 credit element of development work provided students with opportunities to become professional experts in the field of POCT; to improve the quality of POCT; and to develop new tools for everyday practice. The additional task of reporting on their development work by producing a paper for publication in a professional journal was an essential part of the students' learning process since it developed new competences, including communicating in new environments and developing skills in writing for different professional audiences.

The aim of this study is to evaluate the development work carried out as part of the specialist POCT course, using a phenomenographic approach to identify and analyse students' conceptions of their learning and development as professional experts. The study focuses on aspects of development work which were considered important by the students, and investigates differences between students' conceptions of the task. The study examines the extent to which development work assisted students in achieving professional competence, as well as analysing how far development work provided students with the tools to improve practices in their own workplace.

Materials and Methods

Students' concepts can have a key role in developing teaching and learning [10-14]. This study uses a phenomenographic approach to analyse students' conceptions of development work. Phenomenography is a qualitative research approach designed to identify and describe different ways in which a phenomenon can be conceptualised, perceived and understood [15]. The aim of phenomenography is to find out how a given group of people understands different things or phenomena. The perspective of second degree provides a chance to analyse and compare students' conceptions of development [16,17]. In this study, a conception signifies the indissoluble relationship between what is conceived (the conceived meaning of reality) and how it is conceived (the acts of conceiving through which the conceived meaning appears). The students' conceptions thus refer to the relationship between the students and the dimension around them that has been created by their actions. These conceptions are thus students' abstract ways of

connecting themselves to the world around them and to the various phenomena present.

A total of 20 students carried out the development work alone or in small groups. Of these, the majority produced a paper, reporting on their development work, for a professional health care journal. All the students were qualified biomedical laboratory scientists at diploma or bachelor degree level. They were all in employment during the course, and carried out the development work in their own regional workplace.

Methods and analyses

The study is based on open-ended questions, sent by e-mail, about: factors which promoted or hindered learning through the development work; formation of the idea for development work; and writing an article about the development work. The purpose of asking open questions was to give the students an opportunity to present their own views of their life-world.

The data consisted of 13 written answers to 10 questions. The content was analysed using a phenomenographic approach, in order to identify and describe the students' different conceptions of the role of development work in achieving professional expertise in POCT.

The students' replies were analysed in the original textual form in which they were expressed. These texts were read and discussed many times by the researchers with the aim of understanding the meaning of the experiences as presented by the respondents. Direct quotations are used here in order to retain the original semantic content of the conceptions as expressed by the subjects [18].

Results

The following categories were created based on analysis of the students' replies:

- (I) Conceptions of development work as a learning task
 - A. Forming an idea for the development work
 - B. Aspects of development work which promote or hinder students' learning
- (II) Conceptions of development work as achieving expertise
 - A. Development work as a means of achieving new perspectives
 - B. Reporting development work in the form of a published paper
- (III) Conceptions of development work as improving

workplace practice

A. Development work as a means of integrating multi-disciplinary work

B. Development work as a means of improving POCT

Conceptions of development work as a learning task

This category included replies which described the meaning of the learning task in relation to the students' aim of achieving professional expertise as well as factors which they felt affected their learning.

A. Forming an idea for the development work

The students were asked what factors affected the formation of their idea for development work. Some students emphasised that their choice of subject for their development work arose from the workplace, while others highlighted their personal interest, for example "*a new test was going to be implemented in the healthcare centre*" or "*doctors had needed the test*". Students noted problems with familiarising staff with the POCT test, and the need to improve quality assurance in the workplace. Students also mentioned a number of factors which had a negative impact on their choice of development work, including a negative environment in the workplace, staff changes within the organisation and changes to computer systems. One student wrote: "*I started my studies at a bad time, because there were changes going on within the organisation and a new computer system was about to be adopted*". Some students said that they had identified a possible subject for development work by discussing it with other staff beforehand. Some students indicated that information on POCT was unclear and difficult to find.

B. Aspects of development work which promote or hinder students' learning

Most students emphasised how the positive attitude, encouragement and support of their workplace community promoted their development work. Students stated that they received support from a senior physician, a clinical biochemist, a colleague and from the information technology department. One student stated that "*the employer's*

attitude was clearly a promoting factor" and that "*the biochemist was able to give support*". The students' commitment to their own learning schedule also helped students to carry out development work. Some wrote that their own interest and desire to learn provided an impetus. Regarding factors which hindered their learning, students noted the pressures of work and a lack of interest in development work from colleagues. One student wrote that "*the mentor didn't know the purpose of the development work*". Shortage of staff and changes in the workplace led to lack of time. Others noted that a lack of clarity in directing the development work and unexpected interventions from workplace hindered development work.

Conceptions of development work as achieving expertise

A. Development work as a means of achieving new perspectives

For many students, development work opened up new perspectives on POCT at a personal level. They described an improved understanding of the concept of POCT and its limitations. Some students stated that they now felt able to locate relevant knowledge and begin networking. Others reported an improvement in information technology skills. Some students expressed moving from a mechanistic way of working to a more holistic view, for example: "*previously I worked only according to procedure, but now I understand the method more deeply and the threshold to ask questions has decreased*". Some students noted an increased confidence in acting as a specialist in POCT, for example in discussions with physicians or head nurses in the ward. They emphasised their professional development as part of a multi-disciplinary group. In the words of one student: "*In my work as an expert, co-operation is now emphasised more.*" Finally, students noted the impact of development work on quality assurance.

B. Reporting development work in the form of a published paper

The students described this aspect of the course as a largely positive learning experience. For most, summarising the subject and finding the essential content was a challenging learning experience. "*To find that golden*

kernel from a large body of work and to describe the subject briefly has been a challenge". Some also felt that taking the perspective of the reader and adapting the article to the target audience was a meaningful learning experience: "The subject also had to be thought about from the point of view of those by whom the article was meant to be read." Some replies expressed the need for more supervision in writing the paper, and also stated that the writing took more time than they had estimated.

Conceptions of development work as improving workplace practice

This category included replies concerning the quality of POCT and the development of new practices in the workplace.

A. Development work as a mean of integrating multi-disciplinary work

Students were asked about their conceptions of collaboration during development work. A few students thought that development work was a starting point for multi-disciplinary work: "In the health care centre a familiarisation card was used for the first time. We have never used replicate samples before." Some students described how multi-disciplinary work increased and improved relationships between the laboratory and departments. One student said that "At least it produced a new glucose control project". Some emphasised that development work promoted discussion and even changed views on POCT, with many departments requesting more information on sample collecting, quality assurance and the measurement of blood glucose. Awareness of the need for guidance also increased. A lack of collaboration was referred to by some students: "Not yet because there were no official agreements" and "collaboration is appreciated but there is no time for it."

B. Development work as a means of improving POCT

Students were asked how development work had improved POCT testing. Students felt that they had gained new perspectives during development work and that both their own awareness of POCT and that of other health care professionals with whom they had collaborated had increased. "The biggest benefit was getting an

overall conception of the extent of POCT in our institution." Many replies mentioned that students had developed a model for the future practice and quality assurance of POCT. "Now we have a good model when we next implement a new test." New training and equipment had also been accessed as a result of the development work. "I have started a course on the pre-analytical phase related to POCT tests in our town." "Based on the preliminary results, several pieces of equipment have been purchased."

Discussion

Qualitatively different conceptions of achieving expertise in POCT through development work were identified in the students' replies. The results of the study are here discussed in terms of the relational view of learning. The world of work is part of a student's life-world, in which they create a meaningful relationship to the world in terms of their professional growth, through interaction with teachers, other students and others. In relation to this professional growth, education at UAS has an important role in providing varied perspectives on professional knowledge, offering students an opportunity to compare their conceptions and change them qualitatively [19].

In the first conception – development work as a learning task – students demonstrated their awareness of the knowledge and skills they need for daily practice, stating that changes in the workplace and the need to learn new competencies formed the starting point for their development work. They also emphasised the significance of practice as a learning context. Improving opportunities for such practice-based learning environments requires extensive co-operation between employers and education organizations, enabling the integration of theory and practice to increase understanding of the significance of daily practice for professional learning [20]. While some students described the important role of the workplace community in providing support during their studies, others mentioned aspects of work which hindered their learning. Both these views underline the significance of work as a learning context for students. The Ministry of Education and Culture in Finland, in accordance with many models of adult education, recommends that learning for professional expertise take place in the workplace [1].

In the second conception – achieving professional expertise – students expressed how development work opened up new and holistic perspectives on POCT. The

focus was on qualitative learning, which led to new perspectives on the world [11,13,14]. It is particularly significant that students believed that they learned new skills through writing a journal article on the development work. Students noted the importance of taking into account the needs of the reader and the perspectives of other health care professionals. They also emphasised the need to identify the core of the subject and the ability to describe it concisely, demonstrating how their relationship to the demands of their competencies had changed. Writing the article provided an opportunity to learn to express the students' thoughts precisely within a multi-disciplinary team, developing communication skills in practice in response to the challenges arising from the world of work [21].

In the third conception – improving work related to POCT – multi-disciplinary work increased, relationships between the laboratory and other departments improved and a need for collaboration between them was recognised. This is in line with the competences set by the Ministry of Education for health care professionals, including biomedical laboratory scientists. Some students expressed the view that the availability of tools and models for developing POCT, as well as its quality, increased and new working practices were adopted. Awareness of the need to promote quality in POCT can be seen as a starting point for continued learning and development. Carrying out development work at a regional level both added a new relationship to the students' working life, and fulfilled one of the purposes of UAS. It is of interest that although patient safety is often mentioned in discussions of POCT [22], the students in this study did not comment on it.

This study has identified different types of knowledge and meaning in the UAS context. Although the study draws on a small data set, the results can be regarded as being reliable because the researchers ensured that the individuals' unique experience was not lost during the analysis. Since the students' ways of seeing their world are the phenomena that this study investigates, we attempted to reflect their views of their life-world in the categories we created. We were thus able to form reliable categories and analyse the phenomena from multiple perspectives. How far the categories reflect the participants' conceptions and how the quality of education can be improved through them are ultimately the criteria that should be used to evaluate the reliability of this study [11, 23-27].

In summary, the study demonstrates that, according to the students' conceptions, development work promoted their growth towards professional expertise and

helped them to achieve competencies required for the improvement of quality assurance in POCT, including guiding, teaching, acting in real life, and acquiring varied skills and knowledge required by working in changing environments. It also appears that they became ready for postgraduate studies, which is one aim of specialisation courses. Development work appears to be useful and should be taken further, as a collaboration between employers and educational organisations, in order to offer students a better environment to learn professional skills.

Conclusion

This brief study contributes to an understanding of how development work assists in achieving professional expertise in POCT through analysing students' learning in the particular context of an e-learning POCT specialisation course provided by UAS. The learners' responses indicate that development work is effective in strengthening students' professional development, transferring skills to the workplace in order to develop practice in POCT and in promoting the quality of POCT at a regional level, ultimately enhancing patient safety.

References

1. Ministry of Education and Culture in Finland 2010.
2. Niemelä O, Minne menet klininen kemia. Clinical Laboratory Science and Exhibition Days 8.-9.10. 2009; 15-17.
3. Labquality 2009; <http://www.labquality.fi/>
4. Association of Biomedical Laboratory Scientists. Suomen Bioanalyttikoliitto ry. Finlands Bioanalytikerförbund rf . Bioanalytikon, laboratoriohoidajan erityispätevyys 2008.
5. European association of professions in biomedical science. EPBS' Policy Statement on Point of Care Testing (POCT). 16.10.2009.
6. Curriculum (2008-2009). Specialized studies in point-of-care testing. University of Applied Sciences in Helsinki, Oulu, Tampere, Joensuu, Kuopio.
7. Kleinpell R, Bruinsma S. E-learning resources for acute care practitioners. *The Nurse Practitioner* 2010; 35: 12-3.
8. Alonso D, Blázquez E. Are the functions of teachers in e-learning and face to face learning environments really different? *Educational Technology & Society* 2009; 12: 331-343.
9. Cook D, Levinson A, Garside S et al. Internet-based learning in the health professions. A meta-analysis. *JAMA* 2008; 300: 1181-96.
10. Marton F, Booth S. *Learning and Awareness*. New Jersey :

- Lawrence Erlbaum Associates, Mahwah. 1997:110-5
11. Mäkitalo O. Huumevalistus ja sen muunnelmat. Opettajien käsityksiä ehkäisevään huumeuhoon suuntautuneesta koulukasvatuksesta ja opetuksesta. Variation of drug prevention schemes. Teachers' view on education and teaching aimed at drug prevention. University of Oulu: Faculty of Education, Department of Educational Sciences and Teacher Education. 2008; 25-27
 12. Roivio-Johansson A. Being good at teaching. Exploring different ways of handling the same subject in higher education. Göteborg: Studies in Educational Sciences 140. Universitatis Gothoburgensis. 1999; 2
 13. Runesson U. Variationens pedagogik skilda sätt att behandla ett matematiskt innehåll. Göteborg: Acta Universitatis Gothoburgensis. 1999;
 14. Trigwell K, Prosser M. Understanding, learning and teaching the experience in higher education. The society for Research into Higher Education & Open University Press. 1999;
 15. Marton F. Phenomenography – A research approach to investigating different understandings of reality. Journal of Thought 1986; 21: 28-29.
 16. Marton F. Phenomenography – Describing conceptions of the world around us. Instructional Science 1989; 10: 177-200.
 17. Marton F. Cocosco ergo sum. Refelections on Reflections. Nordisk Pedagogik, 1995; 15: (3): 165-180.
 18. Niikko A. Education- a joint task for parents, kindergarten teachers and kindergarten student teachers. International Journal of Early Years Education 2004; 12: 259-274.
 19. Trigwell K, Martin E, Benjamin J, Prosser M. Scholarship of teaching a model. Higher Education and Research & Development 2000; 19:2 155-168.
 20. Reghehr G, Mylopoulos M. Maintaining competence in the field: Learning about practice, through practice, in practice. Journal of Continuing Education in the Health Professions 2008; 28: 19-23.
 21. Kennedy & Reghehr & Baker & Lingard. Point-of-care assessment of medical trainee competence for independent clinical work. Acad Med 2008; 10: 89-92.
 22. Davis N. Learning at the point of care using evidence-based practice resources and clinical decision support. Journal of Evidence-Based Dental Practice, 2008; 8: 181-185.
 23. Åkerlind G. Variation and commonality in phenomenographic research methods. Higher Education Research & Development 2005; 24: 321-334.
 24. Åkerlind G. Principles and Practice in Phenomenographic Research. Proceedings of the International Symposium on Current Issues in Phenomenography Held in Canberra, Australia. Centre for Educational Development and Academic Methods. The Australian National University. 2002
 25. Booth S. Learning to Program. A Phenomenographic Perspective. Göteborg studies in educational sciences 89. Acta Universitatis Gothoburgensis. Göteborg: Vasastadens Bokbinderi AB, 1992
 26. Marton F. The Structure of Awareness In J. Bowden, E. Walsh (Eds.), A Phenomenography Qualitative Research Methods Melbourne, 2000; 102-117.
 27. Green P. A rigorous journey into phenomenography: from a naturalistic inquirer standpoint. In J. Bowden, P. Green (Eds.), Doing Developmental Phenomenography. Melbourne: Rmit University Press, 2005; 11-32.