

Clarifying Vocational teachers' Professional thinking in Oulu Polytechnic

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Introduction

The development of the Polytechnic is based on the so-called dual model, according to which the Finnish higher education system comprises Polytechnics and universities. Oulu Polytechnic is a multi-subject Polytechnic. The objective of the Polytechnic studies is to provide the students with higher educational qualifications and skills that are needed in working life.

The Polytechnics are also expected to play a strong role in the pursuit of research and development work. Research and development work is a basic task in Oulu Polytechnics and has an important territorial developmental aspect. This aspect might influence teachers' ideas about teaching and learning. Therefore it is important and interesting to explain what kind of theoretical ideas and pedagogical thinking is behind vocational teachers' professional behavior. This information gives valuable knowledge about vocational teachers' work, their professional development and their future educational needs.

In addition, considerably greater attention needs to be paid to the teachers' views about research and development and how this work is included in their professional expertise. Therefore it is important to investigate teachers' ideas about research and development and its role in their daily work.

The aim of this study is to explain vocational teachers' views about their profession and professional thinking. The study concentrates on vocational teachers' aspects of teaching, assessing and guiding in Oulu Polytechnics, Finland. Also teachers' ideas about research and developmental work as part of the vocational teachers' profession were investigated.

Theoretical aspects

The theoretical starting points of the study are based on the expert-novice paradigm and the model of the dimensions in

teachers' professional development. In this study constructivist approach is also used to understand and interpret vocational teachers' professional ideas. The development as a teacher is a process that combines initial studies, work at educational institutions and continuing education and training. Teachers' professional development can be seen as a continuous process of learning. In addition, up-to-date and developing professional skills and expertise are important due to the changes in the teaching work (OECD 2003).

Schulman's (1986) framework characterizes knowledge bases necessary for teacher effectiveness, including content knowledge, pedagogical content knowledge, and general pedagogical knowledge. With respect to Schulman's (1986) framework, this study is limited to the personal dimensions of vocational teachers' professional development: understanding their own ideas of teaching, guiding, assessing and their awareness of research and developmental work. The paradigm of expert - novice teachers is interesting to discuss in the light of the mission of the polytechnics in which teaching vocational subjects has a special part of developing specialists for the working life.

The expert/novice paradigm can be discussed shortly to explain differences in the expert and novice teachers' thinking and behavior. The expert teachers have a deep and flexible understanding of both subject contents and pedagogical knowledge. Whereas the novice teacher has greater difficulties to link the subject and pedagogical knowledge to the methods of teaching, the expert teacher brings both of these areas together into a single well-formed lesson plan (Hogan, Rabinowitz and Craven 2003). In general, an expert can be defined as an individual with formal training and experience in the respective area of teaching, whereas a novice can be defined as having little or no formal training and/or experience in teaching.

There also appear to be similarities between expert teachers

and teachers thinking in a constructivist way. Constructivism asserts that learning is the process of constructing meanings and making sense of our new experience, based on our past experiences. Constructivism focuses on preparing the learner to problem solving in ambiguous situations (MacLellan 2005). Philosophy of constructivism suits well the way of learning such practical and applicable subjects as are taught in Polytechnics.

Methodology

The study was carried out as a quantitative survey study. The online-questionnaire consisted of 8 background questions (e.g. age, competence, and teaching experience) and 82 items explaining teachers' opinions about teaching, guiding, assessing and research and developmental work. The questionnaire was in the format of the 5-point Likert-type scale for these 82 items. In the questionnaire there was also one open question to which teachers had a chance to answer by writing down their ideas in their own words. The questionnaire was sent to approximately 400 teachers of whom 42 % answered. The teachers were given one week to answer the questionnaire questions.

In the analysis phase, the SPSS statistical software was used for computation. The data analysis was performed forming sum variables from studied item groups. Compare means of sum variables from studied item groups were statistically tested with t-test and one-way variance analysis (ANOVA). The most important findings will be reported and described by using informative figures.

Research group

The teachers (n=163) who participated are working in all educational units; Culture (9,2 %), Natural Resources and the Environment (7,4%), Natural Sciences (11,7 %), Social Sciences, Business and Administration (18,4 %), Social Services (18,4 %) and Technology, Communication and Transport (30,1 %). The majority of teachers were female (59,5 %). The ages of participants ranged from 20 to 65 years; majority of participants were 41 to 55 years (57 %). Educational levels varied, respondents were lecturers (42 %), principal lecturers (25 %) and part-time teachers (31 %). The majority of participants were experienced teachers, the majority having more than 5 years teaching experience (70 %) or more than 10 years teaching experience (60 %). Most of the teachers were qualified to their teacher work (71 %).

Results

Teachers' aspects of teaching, guiding and assessing

As a whole, teachers have a positive attitude to their work (Figure 1). Teachers' ideas about teaching, guiding and assessing are based on constructive ways of thinking. According to findings teachers' aim is to foster specialists for the working life. This finding is interesting and strengthens the general target of Polytechnics (cf. Heikkinen 1997). To reach this goal, teachers should be experts in their pedagogical and also in subject knowledge.

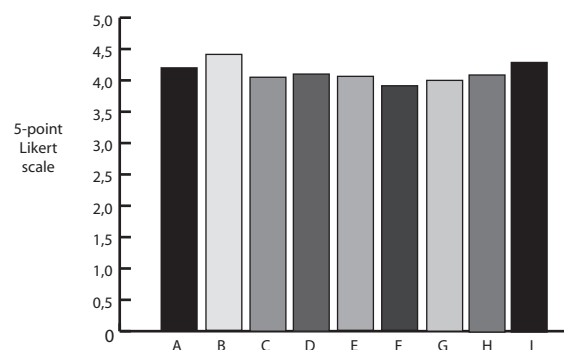
Moreover, teachers emphasize developing students' social skills. In addition, teachers presume that students are active and that students have their own thirst for learning new things. It is also worth mentioning that teachers want to see students as individuals. These findings show that teachers have expertise ideas about perceiving the learning environment as

comprising unique individuals.

According to the findings, teachers believe that to develop students' learning-to-learn skills is an important part of their teaching. This interesting finding shows that teachers have understood the importance of metacognitive skills. The aspects of learning-to-learn, of metacognition, include students' conceptions of learning, improving the organization of their own learning, a move towards self-assessment, and personal development (Case & Gunstone, 2002, 459). However, Case & Gunstone (2002) argued that teachers may need to rethink their teaching if they wish to achieve the aim of developing students' learning-to-learn skills in practice, too.

Moreover, the findings show that Polytechnic teachers try to create a learning climate which can be seen relaxed and supportive for students. In general, when students are willing to ask and answer questions without fear, they feel safe and valued; these elements create the climate in which students can learn more effectively. In the respect of practice, it is a challenging question how to create learning environments that promote deep approaches and help students to use these rather than surface approaches (Marton & Säljö 1973). However, a teacher's skill of creating a warm environment may not be dependent on the amount of experience that a teacher possesses (Hogan, Rabinowitz & Craven 2003, 242).

The findings show that Polytechnic teachers give challenges to their students and try to create a whole out of the topic studied. According to the constructivist ideas about learning teachers should try and encourage students to discover principles by themselves. The challenge in all teaching is to create experiences that engage the student and support his or her own explanation, communication, and application.



Items:

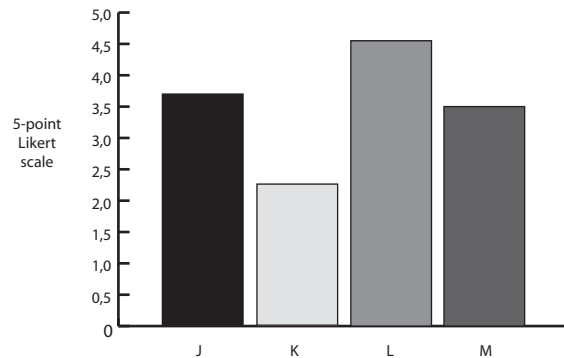
- A) To develop students social skills are essential part of my teacher work.
- B) I suppose that students are active learners.
- C) My teaching focus is to form large wholeness from the studying topic.
- D) My aim is to give challenges for the students.
- E) My aim is to utilize scientific knowledge and practical skills in my teaching.
- F) I believe that students have their own thirst for learning.
- G) In my teaching I support students learning to learn skills.
- H) My aim is to take student individually.
- I) I try to create positive learning experiences.

Figure 1. The teachers' views on teaching and guiding

In the teachers' views of teaching and learning significant differences can be seen according to gender ($p=.04$), educational unit ($p=.00$) and teaching experience ($p=.02$). Female teachers in Social Services, Culture and Social Science units had the most constructive ideas about teaching and guiding in Polytechnics.

According to the results the aim of assessing is clearly to support students' learning motivation, for example by giving verbal feedback (Figure 2). The aim of the teachers is to assess the whole learning process. In addition, self-assessment is an important part of assessing in the teaching process. This result supports the earlier findings where teachers think that

learning-to-learn skills are important and self-assessment is a part of the learning-to-learn skills. However, it is worth mentioning that numerical assessing has a substantial part in the assessment culture in Polytechnics. Constructivism calls for the elimination of grades and standardized testing. Instead, assessment becomes part of the learning process so that students play a larger role in judging their own progress. (Maclellan 2005.) According to our findings it seems that teachers maybe have constructive ideas about assessment but they still use also traditional assessing methods in their work.



Items:

J) My assessing support students learning motivation.

K) I use mainly numerical assessment.

L) I give verbal feedback.

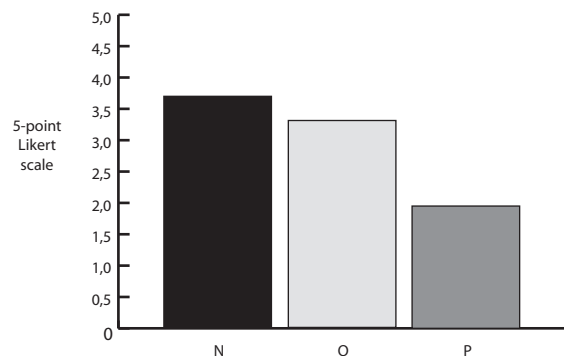
M) I support students to self assess their learning.

Figure 2. Teachers' views on assessing

Women and teachers of humanist subjects have the most constructivist views on assessing. They are also very learner-centred in their approaches to assessment.

Teachers' ideas of research and developmental work

According to the results teachers think that research and development are important (Figure 3). However, teachers think that it is their directors that have strong views on research and development being a part of teachers' work. The findings show that teachers have too little time to carry out the research and developmental work. An interesting finding is also the fact that teachers don't see themselves strongly as territorial developmental agents.



Items:

N) Research and development work is important

O) My director supposes that research and development work is part of my work

P) I have enough time to carry out research and development work

Figure 3. Teachers' views on research and developmental work

Teachers' views on research and developmental work differed according to the educational units. The teachers in the Social Services look most positively at the research and developmental work ($p=.004$). There were also significant differences between

teachers' views according to their posts. Principal lecturers have the most positive attitudes towards carrying out research and developmental work ($p=.04$). This is understandable due to their education: to be a professionally qualified principal lecturer you must be a licentiate or have a doctor's degree which means mastery in research methods.

Conclusion and discussion

Higher education institutions have changed markedly during the last decade (Tynjälä, Välimaa and Sarja 2003). Especially Polytechnics as quite young institutions have met many challenges to develop their organization and teaching. This certainly means that Polytechnic teachers have had challenges to develop pedagogical thinking and practices, and to develop different forms of collaboration with working life. The aim of this study was to explain vocational teachers' views about their profession and professional thinking, and their ideas about research and developmental work.

Firstly, according to the results of the survey, teachers have modern and expert thoughts about teaching. Teaching is seen in a constructivist way; knowledge is constructed by applying knowledge to solving problems in practical contexts. Teachers see students as independent learners who at the same time need teachers' guidance and support. As a pedagogical implication, it seems that teachers should think and be aware of what kind of teaching methods and assessment tools they choose to meet the students' needs of getting essential guidance during their professional learning processes.

Secondly, teachers' ideas about education seem to combine theory, practice and individual experience. This finding strengthens the preconception that teaching in Polytechnics occurs in practical contexts where students have possibilities to deepen and combine their theoretical and practical knowledge. However, it is worth mentioning that teachers' ideas somewhat vary between educational units.

Thirdly, views about the importance and the role of research and developmental work vary among the teachers. Although the research and developmental work should be part of the vocational teachers' daily work, it seems that teachers regard themselves predominantly as teachers rather than researchers. Or perhaps the research and development concept is not as familiar and clear among the teachers as was expected.

Finally, these results are interesting standpoints in the higher education system in general, especially when creating the profile for vocational teachers' work in Polytechnics and in the non-university higher education sector. It seems that the vocational teachers who work in Polytechnics have a broad mission including teaching, research and developmental work. Consequently, their job description might need some clarification.

Questionnaires are the most common tools of researchers. Doubts concerning their effectiveness in obtaining quality measurements have been reported (e.g. Weems, Onwuegbuzie, Schreiber and Eggers 2003). In this study, the survey has given valuable ideas about vocational teachers' professional thinking in Oulu Polytechnics. However, further research is needed in several areas. For example, to get deeper understanding of vocational teachers' professional thinking and ideas, qualitative research methods should be used. This is an interesting challenge of the future research issue. It would appear considerably beneficial in explaining the concept of research and developmental work among polytechnic teachers'.

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