

## Working Knowledge in Vocational Education; Hands-on Activities as the Rotation Point for Learning.

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### **Abstract**

The conceptions of Vocational pedagogy and Vocational didactics are new concepts in educational theory. They have developed in relation to an understanding of teaching/learning processes where workshop learning in schools and learning in working life is at the core. Vocational education contains a variety of different traditions and educational roads, but they are all based on learning through practical activities. Vocational pedagogy is a learner-centred approach to teaching and learning, where the relation between the student and the task is at the core. The central aspect of Vocational Pedagogy is that the work activity itself is the rotation point for learning. In this work I start to explore ways of seeing the unity and variations in curriculum development in vocational didactics brought about by the changes in technology and the development on the manual labour market and in vocational education during the last decades. I also discuss the central problematic of moving from “learning in praxis” to “general knowledge” in a variety of vocational fields in the point of tensions between learning in schools and learning in work life.

### **Introduction**

The developments and changes on the labour market and in family ideology over the past decades have led to profound changes in the training of the labour power usually trained through vocational courses in vocational schools and apprenticeships for the manual labour market and for work in the family in Norway. Similarity and diversity are putting their mark on the field. Variations within the 200 trades classified under Norway’s Apprenticeship Act, stems from different traditions within craft and industry. Some trades date back to the guild system, while others have arisen with industrialization and the development of the service industries. The development of Information and Communication technologies in industrial production changes the labour processes continuously and demands new skills. Another aspect is that labour tasks that were previously taken care of in the private sphere are moved out of the home to the public sector. Women have moved in to a skilled labour market. The need for skilled workers in the expanding caring sector and the professionalization of work with children and youth gave new opportunities for young girls. Today women are trained for a whole range of caring professions in upper secondary vocational school, with two years in school and two years in apprenticeship.

Vocational schools have practiced a traditional division of gender, mainly directing boys towards jobs in the production sector and girls towards the domestic sphere.. Some trades in the vocational programmes have had a mixed recruitment, such as hairdressers, cooks and waiters/waitresses, photographers and dental technicians. (Mjelde 2006:144) But vocational schools for craft and industry mainly represented a man’s world. Most women were traditionally offered a half-year home economics course in vocational schools preparing them for housework. The traditions are still visible, but today women are recruited through vocational routes to work in the public service sector. From the 1970’ies we also saw a drive towards getting girls into male occupations and in the 1980’ies the integration of women into male dominated spheres became a public question of educational policy in Norway, as well as in other Scandinavian countries. (ibid: 147)

The personal development that is part of craft and industry education differs greatly according to the trade, be it the building trades, in a shipyard, in the graphic field or in a butcher shop. The new

service sector training young people for work in kindergartens, hospitals and old age homes has hands-on learning traditions in common with training for fields in craft and industry. But this training also has other dimensions. In the caring trades, for instance, social relations are at the core, meaning training in identification with other human beings - with children in day care, patients in hospitals or elderly people in old age homes.

In this work I begin to explore ways of seeing the unity and the diversity in curriculum development in vocational didactics in different fields of vocational education, from the traditional crafts and industry to the rapidly developing service sector. I will explore how to approach the problematic in order to better understand the unity and the variations in the field of vocational curriculum development as it relates to changes in technology and labour processes. I will also look at variations in different fields, such as the training of the rescue driver, the training of lithographers in a printing firm, the training of truck-drivers and auxiliary nurse training at the point of tension between learning in vocational schools and learning in work life. I will first present the latest reforms in upper secondary education in Norway and then explore this complex problematic.

### **Recent Educational Reforms in Norway**

The relationships in upper secondary education between work and education, learning at work and learning in schools, vocational education and general education, have been the central aspects of the recent educational reforms of Norway. Apprenticeships in the work place, which during the 1960 and 1970s many regarded as a relic of history, have regained their vital importance. During the optimistic times of the 1970'ies, democratic political intentions consisted of a wish to abolish the Apprenticeship Act in favour of incorporating all vocational education into the school system while integrating vocational schools and the gymnasium under the same legal umbrella. A common law for all upper secondary education was applied in January 1, 1976, integrating all schools for students between age 16 and 19.<sup>1</sup> This was an integration of all earlier types of schools, which had reflected the class divisions of society. One fundamental aim of the new law was to bring about equality between practical and theoretical education. The old gymnasiums and the vocational schools should be under the same roof and apprenticeships providing cheap labour and marked by exploitation should be replaced by vocational education within the upper secondary school system.

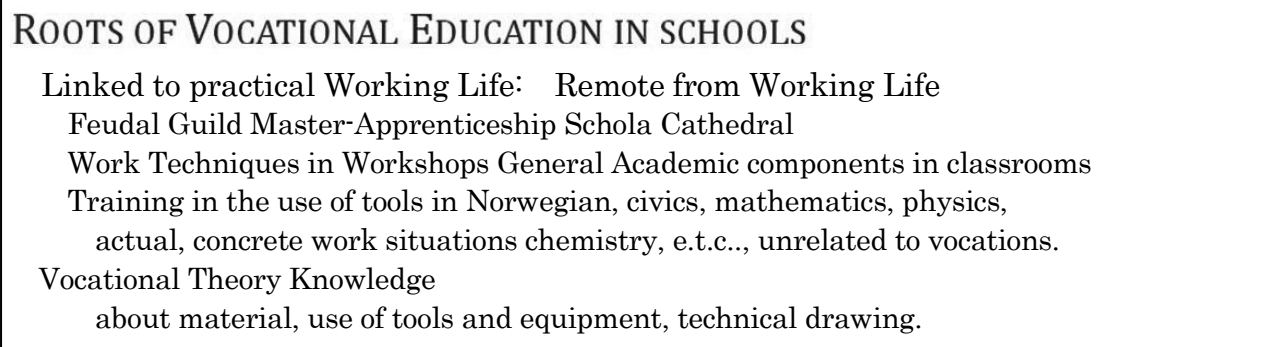
These processes have proved to be challenging and problematic. One could say that in the first decades following the institution of the new law the school system continued as before, with the gymnasium preparing for higher education and vocational education for the semi-skilled and skilled work on the manual labour market. At the same time the question of the qualification of labour power was discussed on a higher level than ever before. Information technology, as mentioned before has changed the labour processes in most vocational trades. The caring professions have developed a platform in upper secondary education and new apprenticeships have developed. The past decades have seen considerable changes in work organisation and new challenges in educational systems in general and in vocational education specifically.

**Reform 94**, the Parliamentary Act passed in Norway in 1994 regarding these issues reformed vocational education such that now the requirement is two years spent at school followed by a two-year apprenticeship in working life. The dual system of combining learning in a school situation in vocational and/or apprenticeship schools is seeing a renaissance now in a more streamlined way (Mjelde 1993:76). This system has now expanded into new areas and trades. More than 200 trades come under the "Law of Apprenticeship in the Work Place" today.

Additional reforms were being implemented during the autumn of 2006 and were called "kunnskapsløftet", which means, "elevating the level of knowledge"(White Paper no.30: 2003-2004).<sup>2</sup> The number of hours spent in workshops, in the bakery and car mechanics shop, where the hands-on

learning takes place, has decreased and academic classroom work has been expanded. All theory courses are to be taken during the first two years, in school. The old apprenticeship schools where the apprentices in earlier days came in the evenings or one day a week have been abolished. The road to craft-certificates through direct entrance into an apprenticeship after compulsory school was closed<sup>3</sup>. Vocational education and the old gymnasiums and stem from different roots in society, the gymnasiums from the old cathedral schools and vocational education from the master/apprenticeship learning traditions in feudal times. I have figured it in the following way:

Figure 1



The Feudal Master/Apprentice traditions are linked to working life and the development of theoretical knowledge is based in practical work. The schola traditions are developed in cathedral schools remote from working life.

Vocational education in schools emerged with industrialization. The aim and the core of this form of education is learning to work or labour, and vocational education has its own pedagogical model and its own work modes (Mjelde 1987,1993, 2006). The main learning arena in vocational schools was practical work, based in workshops and laboratories. Vocational teachers were recruited from the manual labour market. In academic learning traditions school and work life are separated. This is not so in vocational education where labour activities have been the basis for the workshops, in the kitchens, the mechanical engineering workshops and the photo laboratories. Work-based vocations, industrial specializations, commercial and office jobs, agricultural and maritime sectors, domestic handicraft and home economics traditions have been at the core of Norwegian vocational education. The special feature of this tradition is the connection between vocational fields and the country's production activities. Old trades disappear and new trades emerge. Changes in labour processes constantly challenge the need for qualified labour power. Vocational education is constantly changing in league with changes in production.

We have seen a transition from an industrial to a service economy in the Scandinavian countries as elsewhere. Old male trades have disappeared and new female trades have come into being. New trades are acquiring apprenticeship status and new challenges and contradictions emerge in the educational system, whether in school or in the workplace and in the relationship between learning in school and learning your trade in the workplace. Vocational subjects (workshop learning and crafts theory) on the one hand, and general subjects on the other hand, have a long and complex history in the development of vocational education within the school system and today the challenges are on a high level. One may ask if the old Tayloristic way of organizing labour power in production is being challenged and if technological development in general changes the labour processes in a way that contests the traditional division of knowledge, the division between intellectual and manual labour, between academic learning traditions and vocational learning traditions in our part of the world. Learning in workshops/learning in schools after the new reforms place new questions on the agenda

(see also Hardig 1995, Hedmann 2001).<sup>4</sup>

In this work I will begin to explore how we can do empirical work to understand the unity and diversity in the field of vocational pedagogy; what are the specific learning processes characteristic in the training of mechanical engineers, computer-technicians or auxiliary nurses, all of whom in Norway have two years in school and two as apprentices as their program for becoming part of the skilled labour force? What are the similarities and differences between the educational programs? One thing they have in common is that the work activities themselves constitute the rotation point for learning. That is the core in vocational didactics. One of the leading scholars in this field in Scandinavia is Lennart Nilsson. I will go into his work before I proceed to discuss how to go about exploring more thoroughly the unity and diversity in the complex field of vocational education.

### **Vocational Didactics: The Work Activity itself is the Rotation Point for Learning.**

The conceptions of vocational pedagogy and vocational didactics are new concepts in the field of educational studies. The core of vocational pedagogy is related to workshop learning and learning in working life. It is not **teaching** but **learning** which is at the centre of vocational didactics (Nilsson 2000). Nilsson argues that in order to understand what it is that creates good learning situations for students, to understand how teaching problems arise and change for teachers and how progress occur, one must study more than the contents of the teaching. It is also necessary to study how learning is distributed and transformed in the practice of the everyday lives of the teachers and students. One has to investigate how students and teachers view the concrete contents of the teaching, and what, respectively, from the students' and teachers' actual perspectives are considered to be meaningful within the teaching content (Nilsson 1986). Research on vocational education in Scandinavia is a growing field, but it is not much done yet where the focus falls upon the everyday life of the students and the teachers.<sup>5</sup>

Lennart Nilsson's important empirical investigations into workshop learning in Sweden during the 1970s, comprise an exception (Nilsson 1985, 1986, 1998, 2004). Problem-based enquiries were undertaken in order to understand both why the students' learning difficulties arise, and what the teaching problems are in situations where twenty percent of the students stop attending school. Preliminary studies indicate that the majority of students wanted to work with assignments that had concrete applications. Many students complained that they found the work they did and the learning they had undergone to be completely meaningless. What, then, would the students consider to be meaningful and significant? In what time perspective did students think and act? Were there different points of view among students in the same class? One of the things Lennart Nilsson found was that what the learner considered meaningful depended on the concrete relationship between the character of the tasks and the time perspective that the learner had in mind. There were significant variations in relation to the time perspective held by students in the same class or division. Other than by chance, the learner was unable to find meaning in his or her own task-related work. If the work tasks are formulated in such a manner that they could be carried out within the breadth of the individual's own particular concentration (attention span), and if the student had the feeling of having succeeded in the task, then the student's breadth of knowledge and concentration in relation to the span involved in carrying out the task was broadened and extended. Success in small, short-duration tasks made it possible for the individual to become involved in larger and more time-consuming projects. This research finding provides new insights into what constitutes significance or "meaningfulness" and the conditions for progress in learning. These are important perspectives to have when it comes to mastering the more complex tasks one finds in preparing for learning in all teaching situations (see also Grimestad 1993).

Meaning and motivation in relation to learning processes are two sides of the same coin (Enerstvedt 1987: 3, Mjelde 1993: 104-122, Mjelde 2005). Regi Enerstvedt points out that the purpose in every learning process is the preparation for something else. For many, learning in school is preparation for joining the work force. He goes on to say that one of the main problems is the distance between school and work. Lengthening of hours spent in conventional classroom schooling away from practical working life is one of the main problems in present-day school reforms. One of the main problems with *Reform 94* is the reduction of vocational fields and workplace learning in the first year of studies, together with a lengthening of the period of school attendance to two years before one is permitted to learn the trade.

One might say that until now the problem has been located with the epistemological difficulty of integrating working knowledge and academic knowledge, in other words to put words to the teaching and learning processes specific for working class education and vocational education traditions (see also Luria 1976, Mjelde 1987,1990). However, we are now beginning to get empirical work from the different trades and these findings make us pose new questions in the general debate in the field of educational studies.

#### **Vocational Didactics understood from the Points of View of the Special Features of Various Trades.**

Unity and diversity are the trademarks of vocational pedagogy. The unity is found in vocational didactics, which takes as its point of departure **the activity itself** as the site for learning. It also recognises the need for general knowledge in relationship to practical work operations and the cooperative traditions of learning that are part and parcel of such learning traditions. The diversity can be found in the different needs according to different labour processes in different trades and also in the diversity of the use of information technology in the different trades. In the hairdressing field virtual learning is being used for presenting hair-do styles for the customers.(Haaland Sund 2006) In the building trades there is a constant focus on teamwork and accountability via the computer emphasizing an overall view of the whole building process (Mjelde & Daly 2004, Sannerud 2005). The truck driver has a monitor and a camera installed where she/he can find out everything from the weather conditions to road signs, but she/he can also be watched and followed in every step and stop he/she takes (Brynhillsvoll 2007). But hands-on learning is of course the central aspect of learning processes in all vocational and professional trades.

The ICT revolution of recent decades has seen considerable changes in work organization and new challenges in educational systems. On the one hand, information and communication technologies (ICTs) promised to educate and empower societies and were widely promoted as indispensable tools for individuals in their learning, economic and social lives. On the other hand a vast spectrum of social scientists have highlighted the informational, scientific and technological features associated with the construction of "Information" or "Knowledge" societies: that is, societies in which expanding flows of information-communication and knowledge, facilitated by kindred systems of work organization are signified as crucial dimensions in any project dealing with long-term socio-economic growth (Roldán 2004: 120). But the ICT-revolution has created new demands for the training of the labour power as well as new opportunities for the learners.

#### **What Constitutes Competence and Learning Variations in VET (Vocational Education and Training).**

The skills issue on the manual labour market has proven to be a complex issue and has created an intense academic debate during the past decades. This issue is directly related to the development of vocational education and apprenticeship in the industrial era (Mjelde 1997). The ITC revolution challenges the old division of knowledge in general and also in specific trades and professions. New

empirical work in Scandinavia has shown the variations in learning in workplaces and learning in schools and the new challenges both in the workplaces and in the school systems in VET education in its full complexity. Ronny Sannerud's (2005) empirical work from the construction site was linked to how construction workers could imagine their ideal/optimal place for learning and personal development. He has described the situation in the following manner: the former primary relationship between apprentice, master/teacher and fellow learners has now been extended to include other technologically new methods of learning, with databases, electronic textbooks, multimedia presentations and the use of email and the internet to access further information. Grethe Haaland Sund (2006) shows different challenges in the development of training in the field of hairdressing. Hairdressing is a local-based profession with a strong market emphasis on consumer choice and that means that the hairdresser is expected to have knowledge of a vast array of possible styles. Each client's specific desires have to be discussed and realized. No two are alike. Internet makes new hairstyles travel fast and monitors are helpful tools.

Vibe Aarkrog (2006) and Faizul Bhyat (2006) have done their empirical work respectively among rescue workers in Denmark and machine operators in lithography in South Africa and they are posing basic questions in the conundrum of the social division of knowledge in vocational education. Vibe Aarkrog has examined the transfer of knowledge from classroom to the workplace in the training and education of rescue workers in Denmark who are trained both as mechanics and paramedics. One of the main problems is what the apprentices feel they need of knowledge in their complex working life. How to praxis-relate the school curriculum to the tense emergency situation on the job? The rescue workers perceive mechanical breakdowns as most straightforward, where replication and application of formal knowledge could most often be followed, while those problem that involved interactions and human beings were considered more complex. School, with its technical competences seemed most remote from the students when they were involved in people-related rescue and emergency situations. With accidents involving human injury the student has to deal with non-instrumental factors like emotion, pain, stress and mortality while applying their professional judgment and procedures. In life-threatening human emergencies the knowledge transferred is subject to interpretation, something that severely challenges school based education and training (see also Thatt Jensen 2002).

In the development of VET in schools we have the division between workshop learning/vocational theory on the one hand and general/academic school subjects on the other hand. These divisions have, for a whole century, created unhealthy learning situations vocational education. Faizul Bhyat (2006) has been looking for new ways of transcending these contradictions (see also Bongo 1999, Mjelde 2006: chapter 3). Bhyat has been working collectively with young workers, trying to extract general scientific principles of their everyday machine operation. He narrates an experiment in teaching principles of mathematics, physics and chemistry to apprentice machine operators in lithography. His aim has been to 'extrapolate from particulars of practice to generalization of theory with the apprentices by working together with an engineer and a master craftsman. He describes a process of identifying and teaching principles of physics observable to on-the-job machine operators. Kari Kravik (2004) has examined learning strategies in school and work in the training of auxiliary nurses, a profession characterized by the need for understanding human interaction. To practice caring is an important part in the training of auxiliary nurses. The profession demands knowledge of human nature and the will and ability to see the situation of "the other". A clear "other-oriented" dimension exists in the new caring professions; that will say the ability and will to identify with other peoples life situation and to able to evaluate how to handle social relations in their daily work tasks. Communication, caring and cooperation skills are part and parcel of the curriculum. These are looked upon as key qualifications in relationship to developing their identity as auxiliary nurses. This is at the core of the problematic in the new professions related to the expansion of the service sector. While the students in the hospitality sectors have their kitchens and the mechanics have their mechanical

workshops in the school system it is more difficult to create good learning situations in the caring sector. It is difficult to move patients and children into the classrooms (Waale 2008). Praxis-related and realistic training within the school system is a big challenge.

The students have “praxis periods” in workplaces during the first two years before they enter apprenticeships. Schoolteachers supervise and cooperate with counsellors in the workplaces. The schoolteachers say that the students learn these skills the best when they work together with the students in praxis (Kravik p.72). But the problem of meaning and motivation in the classroom-setting in the caring sector is proving to be very challenging for the teachers (Waale 2008).

Ida Juul (2005) examines another dimension of this problematic. She looks upon the paradigm of equal access for working class children to higher education and says that the unintended result of this policy was the strengthening of the widespread belief that intellectual and general skills were superior to practical and work-related skills (see also Kokkersvold & Mjelde 1982). These assumptions are part of the division between intellectual and manual labour and this division is meeting new challenges today with the development of new technology. She found that the apprentices prefer workplace learning to school-based education. This is consistent with my own findings in my studies among apprentices in Norway in the 1980'ies. Out of 1619 apprentices interviewed in five different cities, 1438 or 89 per cent preferred learning in the work situation to learning at school. The weight of “practical work”, “of doing something real”, of “being paid for it” and “good work mates” were the expressions used by apprentices about their contrasting experiences at work and school (Mjelde 1993, 2006). But the reason is not that learning opportunities are better at the workplace than in the vocational schools (Mjelde 1990). The reason is that the students prefer the process of being in real working life to the process of learning in a meaningless school situation. Jens Wilbrandt (2002) sums up his empirical work among Danish apprentices by stressing the necessity of focussing on the relationship between learning in the workplace and the general learning processes. The learning processes of the apprentices must be in focus and each individual must be met where she/he is. (see Nilsson above) But it is not all workplaces that are fit for receiving apprentices. Many apprentices feel exploited. Their growth is not central to their employers. They are looked upon and used as cheap labour and they counts the days till their apprenticeship time is finished (Mjelde 1990).

The social relations in the workplace are of utmost importance for the well being and maturing processes of each individual. 100 apprentices out of 1617 in the “Apprenticeship Project 1982-1984” were critical of their experiences as apprentices in work places. Their labour situations were not good learning situations. But most of them felt more useful, freer, part of the adult world and part of the real working world. Although most apprentices expressed their satisfaction with having obtained an apprenticeship position, their pleasure is measured in relation to something else. It is the experience of the contrast between the meaningless and often painful world of school and a situation wherein they earn money and feel useful that makes these young people prefer to be apprentices (Mjelde 1990:41-43). The time perspectives are also important here. They know that the apprenticeship will end after one or two years.

To sum up, new trades and information technology play different roles within the vast field of vocational education and one of the main features of future projects must be to carry out comparative case studies within different sectors to understand how the development is affecting both the labour and learning processes within each specific field. The concept of “learning in praxis” and moving from this praxis into more general knowledge constitute the central problematic as well as the content of this general knowledge. But how are unity and diversity manifested in relation to the different fields? What are the similarities and differences between “labour and learning” in the different fields? What are the challenges in “hands on learning” when you deal with machines and when you deal with human beings, or when you deal with both? It is challenging to clarify how different learning strategies are necessary for different labour processes related to different economic and social

conditions. The conduct of careful local-level case studies can provide a much needed basis for more informed administrative and planning of future socio-economic and educational learning making at the individual, local community, national, and macro regional levels. Today, as never before, fundamental, operative, vocational didactic knowledge is accessible for advancing vocational learning and the development of vocational identity (Nilsson, 2004, Roldan 2004). In addition, we have a greater understanding of how human beings learn through activity, which is the central feature of vocational didactics. The question of meaning and motivation in learning processes are of utmost importance in grasping the problematic (Mjelde 1993, 2006).

## Conclusion

Twenty years ago, working knowledge, vocational education and apprenticeship were neither on the public agenda nor topics in the academic field of education. They were excluded from the field of history of education, from pedagogy and from sociology of education (Heikkinen & Sultana 1996). General educational debates in Norway went on as if the manual labour market, working class education, vocational education and apprenticeship did not exist. That has changed during the present crisis. Schooling and its remoteness from working life are now central in the discussions of both academic and vocational education. This has put working class and vocational education on the scientific agenda in a new way. Manfred Wahle (2003) outlines a new programme for historical studies for the twentieth century and parts of that research form an important resource not least in the history of vocational education. Historical research is necessary for the self-understanding of vocational education and training both as a disciplinary area and as pedagogical knowledge. Research into people's life histories in this time of expansion of the educational system has also given a deeper understanding of the effect of education in peoples' lives (Goodson 2000, Antikainen 1999, 2005). An understanding of the total organisation of labour and the dynamics of gender, class and ethnicity are important dimensions in future research into the complexities of human beings' relations to work and education (Gonon et al 2001, Husemann et al 2003, Lakes 1997, Carter & Lakes 2004).

To clarify the contradictions as they appear in the curricula of the vocational trades in upper secondary school is not to deny that some traditions are better than others. It is important to put forward an understanding of both sides of this human activity, both the practical workshop tradition and the scholarly general educational route. They should both be taken up, but in such a manner as to enrich one another. At present there is almost a hegemony of academic learning models that reflect the learning traditions of the power elite and disregard the rich and meaningful learning traditions that come out of productive labour (See also Kraus 2004, Koski 2003, Lindgren 2004). But the contradictions can also be made fruitful in so far as they are analyzed openly and plainly, and in this manner, made conscious and comprehensible. An understanding of these contradictions will hopefully contribute to wider democratisation of school and education in general. Critical thinking in the social sciences and interdisciplinary approaches to learning give hope for a deeper understanding of these phenomena and for posing alternatives to executive and administrative ways of thinking that currently have an almost hegemonic grip on the field of education.

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<sup>1</sup> Education in Norway is still mainly public. Few private schools exist. Laws and policies governing the education system in Norway are created by parliamentary decisions. For example, prior to integration, the vocational schools and the gymnasium were governed by separate laws.

<sup>2</sup> The same seems to happen in Sweden and Finland in relation to vocational and adult education. ( see Antikainen 2005, a +b, see also Håkansson & Nilsson 2013, Lundh Nilsson & Nilsson 2010, ) Vocational and Adult education are two sides of the same coin.

<sup>3</sup> This is contested terrain are up for negotiation. But this problematic is not part of my arguments in this paper.

<sup>4</sup> I am not saying that taylorism is dead., especially not in the new service sector, but it is taking new forms in relation to the new labour processes we see in the new vocational trades.

<sup>5</sup> In the later years we have seen an increasing interest from the state in research from the field of Vocational Education in Scandinavia. We can also find important inspiration in some work internationally. Germany has strong traditions in “berufspedagogik”. Ronald Sultana at the University of Malta carried out a large empirical research project on vocational education in Malta (Sultana 1992,1996). Claude Grignon (1971) carried out a project in France over three decades ago. Jeanne Gamble’s work on craft-pedagogy is a new and important contribution (2004, see also Bhyat 2006). The follow-up research of Reform 94 in Norway has advanced the understanding of the field as well (Olsen et al 1986.1998, Olsen 2004). Denmark is conducting empirical work, which will bring us further in our understanding (Aarkrog 2006, Juul, 2005 Nielsen & Kvale 1999,2004,Thatt-Jensen 2004, Wilbrandt 2002). The VET and Culture Network have played a major role in putting vocational education and training on the scientific agenda.