

# Theory and Practice in Technical Vocational Education: Pupils', Teachers' and Supervisors' Experiences

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## Abstract

A gap emphasised in technical vocational education is the theory-practice divide. In relation to learning in technology and learning a vocation, the concepts of theory and practice are often mentioned and how to handle them in education is discussed and problematised. This paper is an empirical contribution to the discussion about theory and practice in technical vocational education. This study takes its point of departure from the pluralistic phenomenology of the life world and the research questions concern pupils', teachers' and supervisors' experiences of theory and practice in relation to teaching and learning in technical vocational education. Pupils', teachers' and supervisors' narratives from qualitative interviews have been analysed thematically, focusing on the content concerning theory and practice. The result indicates there are experiences of theory and practice concerning a traditional dualistic view, but there are also experiences concerning a more interwoven view. The concepts can be handled in a more interwoven way if the individual has a deeper, more complex understanding of them.

## Introduction

In relation to learning in technology and learning a vocation, the concepts of theory and practice are often mentioned and methods of handling them in education are discussed and problematised (e.g. Bengtsson, 1995; Bjurulf & Kilbrink, 2008). The concepts can be handled on different levels and are often used concretely, meaning: school versus workplace, reading versus doing, or language and thinking versus physical work (Berglund, 2009). This dualistic and dichotomised divide between theory and practice is criticised by many researchers (e.g. Allan, 2007; Bengtsson, 1995; Berglund, 2009; Goodson, 1996). Furthermore, different suggestions on methods for how to bridge the gap between theory and practice in learning technology have been suggested in different studies (Allan, 2007; Tempelman & Pilot, 2010). There are also arguments for handling theory and practice as interwoven, in order to learn wholeness (compare e.g. Bjurulf & Kilbrink, 2008). One way to handle theory and practice as part of wholeness is to use the concepts of theory for *knowledge about* and practice for *knowledge in*. This has previously been done in studies about teacher education (e.g. Bengtsson, 1995). Similarly, theory has been used for *knowing that*, and practice has

been used for *knowing how*. This discussion often refers back to Aristotle (Gustavsson, 2002). Nevertheless, the concepts theory and practice often appear in the context of learning technology and learning a concrete vocation. Therefore, there is a need for empirical studies on how these concepts are actually handled, and how this relates to the theoretical discussions about theory and practice.

### ***Aim and Research Questions***

This paper is an empirical contribution to the discussion about theory and practice in technical vocational education. The aim is to reveal how theory and practice are experienced by people being in a technical vocational education, with the point of departure in the following research questions:

*How do pupils, teachers and supervisors experience theory and practice in relation to teaching and learning in a technical vocational education?*

*How do the concepts of theory and practice differ and relate in pupils', teachers' and supervisors' narratives?*

Hence, this study is not aiming to find generally applicable definitions of the concepts, but to describe how theory and practice appear in the informants' narratives about technical vocational education and how the concepts are related.

### **Theory and Method**

Theory and method in this study refer to the phenomenology of the life-world and narrative tradition. According to this phenomenology, there is only one world, but we experience it differently according to perspectives, positions and previous experiences (Bengtsson, 2005). Therefore, the lived and experienced world is the focus of the research. Consequently, meeting with the people involved with the part of the life world we want to study is necessary, in order to say something about phenomenon in the life world. In this study, semi-structured group interviews, as well as individual interviews (Kvale, Brinkmann, & Torhell, 2009) serve as the empirical basis for the results. The informants' narratives from the interviews have been analysed thematically (Polkinghorne, 1995), focusing on the content concerning theory and practice.

### ***Informants***

The informants in this study all participate in the *LISA*-project (*Learning in Several Arenas*), where pupils, teachers, and supervisors at companies in vocational education are followed for a period of three years. They are all involved with teaching and learning in the Energy and Industry programmes at Swedish upper secondary school, in a vocational school system, where half the time is spent in education at school and half the time in workplace training. The empirical material for this paper is based on sections of interviews with two teachers, four supervisors and two pupils, where experiences of theory and practice are brought into focus.

### **Results**

In the presentation of the results, the informants' narratives about theory and practice are synthesised into common narratives. Quotations from the interviews are interwoven in the description of the themes below, in order to keep the presentation close to the empirical material and to raise the informants' voices. These quotations are marked with quotation marks. The themes have emerged from the data and aims to reveal the informants experiences, as they are expressed in their narratives about theory and practice. The themes were not predefined, and the result does not claim to answer what really happens in the vocational education, but to present told experiences of people being in vocational education.

## ***Practice as it Differs from Theory***

### *Practice as using the body and different senses*

In the study, there are many examples of experiences of practice as using the body and different senses. It can be about watching, touching and seizing. By working practically, you are able to get a feeling for how to do, “that, you cannot get from a theory book”, supervisor Ernst says. Furthermore, practice is often related to working with the hands. Student Emanuel tells that practice for him is to work “with the hands” and supervisor Ingemar says that practice is “what they do with the hands, starting the machines”.

### *Practice as something physically heavy*

Some of the informants talk about practice as something that is physically heavy. This is a theme that foremost has emerged in the narratives from the supervisors at the energy programme, those who work as plumbers. Supervisor Ernst tells that it is important to be strong when working practically. He contrasts this practical work to a theoretical person, “who will fail” and says that is not possible to carry a heavy furnace down a stair “if you don’t have a body for it”.

### *Practice as using what you have learned*

One theme is about practice as using what you have learned; to apply what you have learned theoretically on something. Student Isak tells that “theory, that’s what you learn for work, what you do at school is theory, I suppose, what you learn and read. And practice is when you use the theory”. Supervisor Ingvar says, in relation to theory and practice, that it is not obvious that you know something, just because you have read about it; “but if I have done it a couple of times, then at least I know better”.

### *Practice as the workplace training*

In Swedish vocational school, the word practice can be used as a common word for the workplace training. Student Isak says that he is not allowed to weld at the workplace “practice”, but at school. He tells that he has been welding at school, but “on the workplace practice I don’t do that” and “here at school in the beginning, we had a lot of theory, and then I was able to weld a lot”. Accordingly, the place, and not the action, is related to practice in this theme. Teacher Erik tells that the pupils “can go out to workplace practice directly, without knowing anything, but at the same time it is good to have some knowledge before”.

## ***Theory as it Differs from Practice***

### *Theory as a starting point for practice*

This theme pertains to experiencing theory as something you have to read, or understand, before you are able to perform actions in a certain way. How much theoretical knowledge you have gained also influences how you learn. Supervisor Ingemar tells that theory “goes more in depth” and that depending on how much theory the students have studied before they go to practice, they learn differently. Student Emanuel tells that theory is about preparing and that theory takes time. Furthermore, he tells that you prepare at school, before going to the workplace, and that “theory, yes it is, just sitting at school reading about heating and sanitation”.

### *Theory as experiencing*

One theme concerning theory is that theory has to be experienced. When some things are studied at school, “it gets a bit abstract for them [the students] at the beginning, they need to get out to see and to hear the differences” says teacher Ivan. Supervisor Ingemar agrees that “it must be expe-

rienced” in order to be memorable, if the students just study something “in theory” and “are not able to use it quickly enough” they will forget it. Furthermore, theory is also about talking, showing and explaining to the students. Teacher Erik tells there is theory in the workshop hall in the school, because he “always talks to them [the students]” and tells the students “look; now I do like this”. Student Emanuel tells that if there is time, they also have theory at the workplace, because he “asks a lot” and that theory is about “things we point at, and talk about”.

#### *Theory as non-perspiring work*

There are no obvious definitions of theory and practice. At first, teacher Erik says that it is really easy to define the concepts, but then he changes his mind and says that it can be complicated. For him it is not a matter of course to separate them in his teaching, but still he tries to define theory as “when you don’t get sweaty”. Supervisor Ernst tells that some pupils do not handle the physical work properly and that those pupils “probably are better suited for theory”.

#### *Theory as knowledge about something*

A common theme in the narratives is theory as knowledge about something, that you understand something, or that you learn something new. Student Isak tells that theory at the workplace concerns learning something new; “they have a lot of courses here [at the workplace] sometimes too, then all are gathered together and learn something new, and if it is new, then it is a bit of theory, I suppose.” Furthermore, supervisor Ingemar tells that there is some theory at the workplace, even if he thinks that theory mostly is connected to school. At the workplace “we read drawings, following the whole process when you receive a product, that’s things you do.” Teacher Ivan tells that theory exists foremost in books, “or in my mouth”. If something happens, if there is a problem, an alarm for example, the students have to know what to do, and this knowledge is in the books.

### ***Theory and Practice as Parts of Wholeness***

#### *Theory and practice in different arenas*

The division of theory and practice often refers to what is done in the different arenas, i.e. school and workplace, where the theory is connected to school and practice to the workplace. Supervisor Ingvar says that “at school, there is more theory” and at our workplace it is “just practice”. Supervisor Ingemar tells that “many times, theory is what you do first”. The theory is the fundamental thing, and that is what “you learn in the first semesters at school.” Also, the teacher Ivan says that the students “get the basics at school.” Furthermore, this basic education the students need in order to “develop further at their workplace learning” Ivan continues.

#### *Theory and practice as a whole*

In order to understand wholeness, both theory and practice are needed. Student Emanuel tells that “at school, we can use paper and try to check the drawings and how it should be done, but firstly, when you are out here [at the workplace], you can understand how it works.” Supervisor Ingemar tells that financial reasons can be an obstacle for conducting the education as you wish. Often theory and practice are alternated in the vocational education in this study, and Ingemar tells that “we would like to have a machine” for practicing programming at the company, but “unfortunately it is not possible in reality” and then “we have to do the practice and theory in relation to that we run [the machine] with a product that we will have to get paid for”. Furthermore, specific learning content can be introduced from different angles. Either you can start in theory, or you can start in practice. Teacher Erik tells that “if you are supposed to explain something difficult to the students, then you can either start with theory, or you do the opposite way, you start with the practical part. Nevertheless, it is good to have two entry keys”.

## Discussion

In this study, theory is often related to school, to think and read and to prepare for workplace training. Furthermore, practice is related to the workplace, to physical work, to use the body and the hands, and it is also related to using what you have learned. However, it is also more complicated. When deepening the discussion, it is not obvious how to divide or define the concepts of theory and practice. Hence, there are two levels of experiencing theory and practice in this study. In the first dimension, it corresponds to the dualistic division presented in earlier studies (compare e.g. Berglund, 2009), but in another dimension, when there is a deeper discussion about the concepts, they become more interwoven in the informants' narratives.

Some of the themes emerging in the narratives correspond to the dualistic division of theory and practice, where for example the learning arenas serve as the basis for the difference between the concepts, as in *Theory and practice on different arenas*. Furthermore, theory is experienced as the preparation part of the education in the themes *Theory as knowledge about something* and *Theory as a starting point for practice*, whereas the practice is experienced as the application or use of the theory in the theme *Practice as using what you have learned*. Moreover, there is a division on the individual level, concerning which parts of the body are used for the different concepts, where *Practice as using the body and different senses* and *Practice as something physically heavy* refers to using the whole body in a way that is not visible in the theme of *Theory as non perspiring work*. In the results it seems to be important, according to the narratives, to define this division at the beginning of the students' learning, where the basic knowledge and preparing part is related to school and described as a prerequisite for further education and work for the students. However, the further into the education and the deeper the knowledge that the discussion concerns, the more interwoven the concepts of theory and practice appear. Hence, there are themes where the concepts of theory and practice are experienced as more complicated. A more holistic view of the concepts theory and practice can be seen in the themes *Theory as experiencing* and *Theory and practice as a whole*. The informants present more nuanced experiences, when the discussions about the themes are deepened. For example, theory and practice can be seen as different "entry keys" to learning, and there is theory at the workplace and practice at school. Some experiences also refer to the students sometimes having better possibilities to participate and try different tasks that are experienced as practical at school, rather than at the workplace training. This indicates that time consuming tasks that the learner needs to have practical experiences in to facilitate learning are not always better learned at the workplace. Although authentic learning at the workplace is argued for in other studies (e.g. Billett, 1994), the result from this study indicates that the education needs to be complemented with conformal educational settings, including aspects of the education that are commonly experienced as practical.

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