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## Original Article

# Role of Headmasters, Teachers, and Supervisors in Knowledge Transfer about Occupational Health and Safety to Pupils in Vocational Education



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## ABSTRACT

**Background:** Young people are at an increased risk for illness in working life. The authorities stipulate certain goals for training in occupational health and safety (OHS) in vocational schools. A previous study concluded that pupils in vocational education had limited knowledge in the prevention of health risks at work. The aim of the current study, therefore, was to study how OHS training is organized in school and in workplace-based learning (WPL).

**Methods:** The study design featured a qualitative approach, which included interviews with 12 headmasters, 20 teachers, and 20 supervisors at companies in which the pupils had their WPL. The study was conducted at 10 upper secondary schools, located in Central Sweden, that were graduating pupils in four vocational programs.

**Results:** The interviews with headmasters, teachers, and supervisors indicate a staggered picture of how pupils are prepared for safe work. The headmasters generally give teachers the responsibility for how goals should be reached. Teaching is very much based on risk factors that are present in the workshops and on teachers' own experiences and knowledge. The teaching during WPL also lacks the systematic training in OHS as well as in the traditional classroom environment.

**Conclusion:** Teachers and supervisors did not plan the training in OHS in accordance with the provisions of systematic work environment management. Instead, the teachers based the training on their own experiences. Most of the supervisors did not receive information from the schools as to what should be included when introducing OHS issues in WPL.

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## 1. Introduction

The National Agency for Education is the central administrative authority for the public school system in Sweden. The Agency's education act for upper secondary schools established that pupils should develop and acquire values and knowledge [1]. To acquire knowledge that will enable them to personally contribute towards the prevention of a harmful environment is another important goal [2]. To reach these goals, the Agency established guidelines for schools in which headmasters and teachers are to plan their teaching and to determine what aims they should examine [3].

The Swedish Work Environment Authority is working for the right to healthy, safe, and stimulating working conditions. A way to reach this goal is to issue regulations. One such regulation that workplaces must have in place relates to systematic work environment management (SWEM). The aim of this provision is to continuously work on the implementation of safety improvements in the workplace and to provide opportunities for workers to contribute toward those improvements [4].

The literature clearly demonstrates that, compared to the older workforce, young people are more vulnerable to incidents and accidents when entering the workplace [5,6].

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Some studies have concluded that training in occupational health and safety (OHS) is important and needs to be included in vocational training and in workplace-based learning (WPL). This training can be applied to the learning method as well as to the course content [3,7–10]. The literature features several studies that, in general, discuss the importance of choosing methods to successfully motivate pupils to assimilate and use new knowledge. Several cases mention interactive methods, specially developed programs, and daily coaching of supervisors as new and effective methods for reaching the younger generation [11–16].

Another study points out that, even if good instructions regarding safety issues are present in the workplace, such instructions are inadequate for those in WPL [17].

Köpsén's [18] studies on the ways in which vocational teachers describe their teacher identities show that teachers believe that their fostering role, as well as their life and work experience, is important.

Several authors highlight the importance of close cooperation between school and work in order to convey relevant and desired knowledge. The knowledge of teachers and experts in the workplace must have a higher status, and the different systems must find a model of cooperation and partnership. Companies must also be more willing to provide WPL for pupils [19–22]. The literature illustrates that communication between pupil, teacher, and supervisor is the most successful way to reach training goals [23].

A previous study concluded that vocational education pupils had a limited knowledge of how to prevent health risks at work and lacked a systematic way to approach hazard control [24]. Therefore, the aim of this study was to identify how training in OHS is organized in vocational education. In conjunction with that aim, the following aspects were examined: (1) headmasters' opinions of their roles; (2) how teachers organize training; and (3) how training is organized as a part of WPL.

## 2. Material and methods

### 2.1. Study design

The study design used a qualitative approach that included interviews with headmasters, teachers, and supervisors. Headmasters were interviewed to gain an understanding of their overall goals for education on health and safety issues. Teachers were asked about the daily training of pupils with respect to health and safety issues. The vocational school pupils were participating in WPL; their supervisors were interviewed about the content in the WPL introduction and about the work tasks.

### 2.2. Study group

The Swedish education system is based on 9 years of compulsory school. After completing compulsory school, at the age of approximately 16 years, all youths are entitled to continue with a 3-year voluntary upper secondary school education. The upper secondary school consists of 18 different national programs. Some of the programs focus on the study of science, and others are vocational programs that include WPL [25].

The study group consisted of 12 headmasters and 20 teachers in 10 upper secondary schools and 20 supervisors at WPL companies. The 10 schools were included in the previous study of pupils' in vocational education knowledge about OHS [24]. Six of the teachers taught graduating classes in industrial technology programs, five teachers taught in the restaurant management and food program, five teachers taught in the transport program, and four teachers taught in the handicraft program (in which pupils specialized in wood). The supervisors worked at five industrial settings, five

transport companies, five restaurants, and five wood companies (Table 1).

The upper secondary schools and the WPL companies are located in the middle region of Sweden.

The schools, which are both private and community schools, were selected from a register of the Swedish National Agency for Education. The workplaces and supervisors were all used in the WPL arranged by those schools.

### 2.3. Interview protocol

The interviews were undertaken on an individual basis, with each lasting approximately 45 minutes, and were conducted by two of the researchers.

The interviewees were initially verbally informed about the purpose of the study, and then by an informative letter, to determine the extent of pupils' education about OHS and risks in their future work. The interview guide consisted of opening questions and four to five main questions. All participants were asked to describe their backgrounds. The main questions posed to the headmasters were the following: "How is SWEM organized at the school?"; "How is the pupils' OHS-education organized?"; "What kind of routine does the school have concerning pupils' WPL?"; and "How does the school train the supervisors at WPL?" The main questions asked of the teachers were as follows: "How do you organize the pupils' training in OHS issues?"; "Describe the pupils' interest in OHS issues"; "What are you doing to increase their interest in OHS?"; "How do you follow up the pupils' WPL?"; and "How do you cooperate with the WPL supervisors and companies?" The main questions posed to the supervisors were as follows: "How do you introduce the pupils to OHS?"; "Describe the pupils' interest in OHS issues"; "What are you doing to increase their interest in OHS?"; and "How do you cooperate with the vocational schools?" Additional probing questions followed each question.

### 2.4. Analytical procedure

The interviews with teachers and supervisors were audio-recorded and transcribed by a professional. The headmaster

**Table 1**

Study population divided into headmasters, teachers in represented programs and supervisors in companies used for WPL

Headmaster	Teacher at respective program	Supervisor in company for WPL	WPL company number of employees
No. 1 (M)	Transport (M)	(M)	4
No. 2 (F)	Transport (M)	(M)	39
	Handicraft, wood (M)	(M)	11
No. 3 (F)	Industrial technology (M)	(F)	1,500
No. 4 (M)	Handicraft, wood (M)	(M)	327
No. 5 (M)	Handicraft, wood (M)	(M)	4
No. 6 (M)	Industrial technology (M)	(M)	11
No. 7 (F)	Rest management and food (F)	(M)	3
No. 8 (M)	Rest management and food (F)	(F)	10
	Industrial technology (M)	(M)	7
	Transport (M)	(M)	12
No. 9 (F)	Rest management and food (M)	—	—
	Industrial technology (M)	(M)	15
	Transport (M)	(M)	6
No. 10 (M)	Rest management and food (M)	(M)	8
	Industrial technology (M)	(M)	28
	Handicraft, wood (M)	(M)	3
No. 11 (M)	Rest management and food (M)	(F)	20
	Transport (M)	(M)	10
No. 12 (M)	Industrial technology (M)	(M)	48

F, female; M, male; WPL, workplace-based learning.

**Table 2**  
Length of service as teacher in vocational education

Vocational program	Teachers (n)	Length of service (y), median (range)
Industrial technology	6	11 (6–30)
Handicraft, specialized in wood	4	22 (10–29)
Restaurant management and food	5	12 (11–32)
Transport	5	15 (9–35)
Total	20	16 (6–35)

interviews were audio-recorded and, immediately upon completion, summarized in writing by two of the researchers. The data were analyzed by content analyses [26,27]. The interviews were analyzed separately by the researchers who conducted the interviews. The results were discussed to identify similarities and differences in the analyses.

### 2.5. Ethics

This study was approved by the Regional Ethical Committee in Uppsala, Sweden.

## 3. Results

### 3.1. Respondents' descriptions of their backgrounds

#### 3.1.1. Headmasters

All 12 headmasters had previously worked as teachers. Eleven of them had completed headmaster training, and five had received specific training in OHS.

#### 3.1.2. Teachers

Ten of the 20 teachers had received specific training in OHS. At one of the schools, all teachers had received a 4-day basic training in OHS. The teachers in the transport and wood handicraft programs were offered training in OHS that focused on risk for accidents at work, by the union and employer organizations. Two of the teachers had received training in psychosocial issues by the union, and one teacher pointed out OHS as having been included in the education for managers. Teachers in the industrial technology and restaurant management and food programs were, to a lesser extent, offered further training. Teachers' experience in terms of years of employment is shown in Table 2.

#### 3.1.3. Supervisors

All 20 supervisors considered their work as supervisors of pupils to be both interesting and incentive. Five of the supervisors had received training as supervisors of pupils, and one had participated in a meeting that was organized by the schools for supervisors. In most cases, no special benefits were given to the supervisors, either from the companies or from the schools. Two of the supervisors in the transport program received salary increases, and one supervisor received a Christmas present from the school. The most common reason for the companies to participate as WPL companies was to have a chance to test potential new employees. In answer to the question about their expectations of the school, six of 20 supervisors wished for meetings with the school in order to obtain more information about their supervisory roles. Years served as supervisors of pupils and the numbers of pupils supervised are shown in Table 3.

### 3.2. Routines regarding SWEM

Although the headmasters were well acquainted with the provision for SWEM, they incorporated it into their work in different

**Table 3**  
Experience as supervisor in vocational education

Vocational program	Supervisors (n)	No. of years as supervisor, median (range)	Pupils (n), median (range)
Industrial technology	6	5 (1–8)	11 (1–16)
Handicraft, specialized in wood	4	10 (<1–32)	10 (1–80)
Restaurant management and food	5	5 (1–10)	10 (3–10)
Transport	5	2 (1–10)	4 (2–10)
Total	20	5 (1–32)	10 (1–80)

ways. All of them had safety representatives among staff as well as among their pupils. They all held regular staff meetings, and seven of them allocated work environment tasks to the staff. Two of the seven had written allocations. Five of the headmasters performed risk analysis regularly and five additional supervisors can do so, if called for. Six of the headmasters had informed the teachers about the provision, and four of them had informed the pupils.

The teachers and supervisors were not asked specifically about the provision, and none of them mentioned it when they discussed teaching and training in OHS.

### 3.3. Headmasters' opinions of their role

Eight of the headmasters stated they had knowledge of how teachers provided training in OHS, but only four knew in which school year the training was placed. All of them said that the teacher could decide, either individually or together with other teachers, the kind of teaching material to use.

Ten of the headmasters reported that the teachers were responsible for finding companies for WPL. Two headmasters said that they had assigned staff members to be contact persons for WPL. Five of the headmasters stated that they had written agreements between the school and the companies. Eleven of them said that the teachers were visiting the pupils at WPL.

It's not so formalized at smaller enterprises. The teachers have the contact when visiting the workplace...they see it pretty much as they come out... (headmaster)

Eight of the headmasters reported that the school invited staff at the WPL companies to train as supervisors. Four of them invited supervisors to meetings at the school.

### 3.4. Training in OHS at school

#### 3.4.1. Teachers' general opinions

Nineteen of the 20 teachers reported that they followed the Swedish National Agency for Education's school plans. In contrast, the teachers expressed uncertainty as to whether the schools had their own school plans.

I am trying to follow the school plans from the Agency for Education. I am the only teacher giving the course in OHS, so I have to plan it myself. (industrial technology program teacher)

All 20 teachers in the four investigated programs stated the importance of OHS training, in theory as well as in practice. They also described how they adapted education to the pupils' ability to understand.

Oh no, then we have to go slower so we have time for it, because they are not taught by someone else...it is absolutely forbidden. Have they been gone a day when we have gone through the

machines, then they have to get private instruction when they come back, from a teacher who shows them exactly. (wood handicraft program teacher)

The teachers in all of the included programs stated that during the 1<sup>st</sup> year of study they included the course “Occupational Health and Safety.” At three schools, the pupils had to perform risk analyses as a part of the course. One school having three of the four programs annually distributed a publication dealing with school rules and goals that included OHS at school. Both teachers and pupils had to confirm via their signatures that they accepted the rules. One teacher in the restaurant management and food program said that the teachers were free to organize the education in their own way.

#### 3.4.2. Program-specific opinions

In the industrial technology program, all six teachers described how they performed the theory portion of the course during the 1<sup>st</sup> week, when the pupils waited for their personal protective equipment. After completing the theory portion of the course, they went through information on the function of, and risks associated with, every machine in the mechanical workshop at school. The teachers also pointed out the safety regulations for the machines, and how exhaust works.

All four teachers in the wood handicraft program described how, during the 1<sup>st</sup> year of study, they taught the pupils to produce a pallet. The teacher first showed how each step would be performed, and went through the risks associated with every step, before the pupils were allowed to start. One teacher stated that the pupils had to read about the machine and answer some questions about risks before the teacher went through information about the machine.

We have involved OHS in most of the vocational training. First we give a lecture about OHS, and then we involve it in practical work. (wood handicraft program teacher)

In the restaurant management and food program, three of out of five teachers went through information on ergonomic, chemical, and physical risks, such as burns, cuts, or slipping at work in the school restaurant. Two of them also went through psychosocial risks, such as violence and menaces in the workplace, as well as alcohol and drug abuse.

We are talking about everything. Attitudes towards each other, managers, workers, alcohol problems, anything...even bullying and sexual harassment. (restaurant management and food program teacher)

One of the five teachers for the transport program stated that pupils had to perform risk analyses, which also included psychosocial issues, as a part of the course in OHS. Another teacher went through the importance of good sleep, rest, and eating habits. Four of the teachers reported that the pupils were taught to load and unload freight at school. In the instructions, they also included the overall risks associated with loading and unloading freight, but also explained how to use lifting equipment. Two teachers pointed out that OHS were included in the course for a driver's certificate of professional competence and lifter driving.

Loading, unloading, and every time we start, also do a safety check on the car and the load. Everything they will go through, we take the time needed to simulate a workplace. (transport program teacher)

#### 3.4.3. Pupils' interest in OHS issues

Sixteen of the teachers assessed pupil interest in OHS as low. But even if the interest was weak in the beginning, it increased

gradually. One teacher pointed out that one of the teacher's tasks was to connect OHS with pupil interest in work.

The pupils do not realize that OHS really is important. And I think that when they are in WPL they find it to be clearer...so it may be a cultural issue. (industrial technology program teacher)

#### 3.4.4. Teaching material

All 20 teachers stated that they were free to choose the teaching material they preferred. Fifteen of them used a textbook entitled *Occupational Health and Safety*, which included a workbook. The problem was to find new material, and 12 teachers stated a need for more time to find new and modern teaching material. Ten teachers had created their own material, and two of the teachers used films. Seventeen of the teachers collaborated with teachers in other subjects or authorities outside school. For example, the physical education teacher often taught ergonomics, and the fire brigades taught about fire hazards.

To summarize, all of the 20 interviewed teachers included the course “Occupational Health and Safety” in their education. The practical training in OHS was specific for risks in each program. Sixteen of the teachers assessed pupils' interest for OHS as poor. Twelve teachers wished for increased time to find new material and thereby develop their education in OHS.

#### 3.5. Training in OHS at WPL

##### 3.5.1. Teachers

3.5.1.1. *General opinions.* Eight out of 20 teachers stated that they usually visited each company before it was approved for WPL. Most of the schools, however, did not make any specific demands on the companies. They had to accept what was available and reported that it was often difficult to find companies for WPL, especially in small communities or in communities with more than one school offering the same vocational programs.

One of the teachers stated that the manager's attitude toward staff was of importance.

The teachers stated that even if the pupils got their course in OHS during the 1<sup>st</sup> year of study, they could be placed in WPL before they had enough knowledge about OHS. The education was not addressed to the specific work conditions at each workplace. After the pupils' WPL, 15 of the teachers did not discuss the pupils' experiences concerning OHS issues.

3.5.1.2. *Program-specific opinions.* There was, however, one teacher in each of the three programs who more actively addressed safety issues after the pupils' WPL. At one of the schools in the industrial technology program, the teacher stated that the pupils had checklists with OHS issues to go through during the WPL period and which they had to present when they got back to school. At another school, in the restaurant management and food program, the pupils had to write a report that included OHS issues at WPL. And at one of the schools with the transport program the pupils kept a diary, which they went through in the class after WPL. When the teachers in the restaurant management and food program visited the pupils at WPL, they discussed stress and the kind of reception pupils had got from their supervisor.

We are addressing how they have been treated from the beginning. We always include treatment in OHS...how stupid you feel if you do not know how things work.... (restaurant management and food program teacher)

All four teachers in the wood handicraft program always covered risks in the work environment before the pupils went to

WPL. One teacher in that program also covered the use of pupils' personal protective equipment.

**3.5.1.3. Collaboration with WPL workplaces.** The teachers' collaboration with the companies at WPL differed. Most of the big companies had a better collaborative structure compared with smaller companies, where the contact was more casual.

They get a paper from the school on which we have written what they will go through with the pupils as they start their WPL. But there are differences between workplaces. Some companies have professional people who introduce staff, and then there are the smaller companies, where they only say 'hi'.... (industrial technology program teacher)

All 20 teachers in the four programs said that pupils brought their own personal protective equipment. The company often provided earplugs and protective gloves, but protective aprons and flame-retardant clothing were loaned if necessary.

Eleven of the teachers visited the pupils at some point during the WPL period. One teacher stated that he always visited the workplace together with the pupil prior to the WPL period. Another teacher indicated that pupils were required to write their own résumés and give them to the workplace supervisor. The teachers in the transport program phoned the pupils more often than they visited them, because the pupils traveled from site to site. Teachers in the restaurant and food program also experienced some difficulties in visiting their pupils who were in WPL at restaurants in remote locations.

All teachers in all programs wished for the opportunity to offer better training to supervisors. The schools had tried to organize meetings for the supervisors, but few of them had opportunities to come. One teacher said that the community organized training for all supervisors.

### 3.5.2. Supervisors

**3.5.2.1. Introduction, general.** Routines for introducing pupils to OHS on the 1<sup>st</sup> day of WPL differed between the supervisors. None of them had received any information from the schools as to what should be included in the introduction of OHS issues. The supervisors' collective opinion was that knowledge about risks at work should have been provided to the pupils at school.

They are of course familiar with the risks at school. (wood industry supervisor)

None of the supervisors knew whether the teachers at school followed up on what the pupils learned about OHS in the WPL.

I have no idea if the school follows up what the pupils learned during practice. (mechanical industry supervisor)

**3.5.2.2. Introduction, program-specific.** The supervisors in restaurant companies typically went through information about escape routes and fire hazards on the 1<sup>st</sup> day of WPL. Other risks, such as workers cutting themselves and slipping, were pointed out later.

Informing them about what happens in case of fire is when I show where the exits are and where the assembly points are. (restaurant supervisor)

All 10 supervisors in the wood and mechanical industries went through information about risks associated with each machine before the pupils started to work with the machine. At two of the wood companies and at one of the mechanical companies, written instructions were placed beside each machine.

I show how to do. And then I stand behind, looking and showing. (mechanical industry supervisor)

Three of the supervisors in the mechanical industry pointed out the importance of using personal protective equipment. Another supervisor in mechanical industry stated that the school had the responsibility to inform pupils about the use of protective equipment. In order to make pupils feel welcome, the supervisors also asked them to join them for lunch and coffee breaks.

The four supervisors in the transport companies provided short introductions to the trucks. They mostly talked about risks in traffic. One supervisor also talked about risks in loading and unloading the freight. Four of the supervisors pointed out stress as a big risk. The stress in traffic was associated with demands to deliver on time and to comply with rules on driving times and rest periods.

Worst is probably the stress, so that you stop thinking. You just stress on and start to fool around by throwing stuff and jump down from the flatbed...." (transport company supervisor)

One of the supervisors reported that pupils from one school brought a checklist that included risks in a workplace. The checklist was to be reviewed together with the supervisor.

Another supervisor at a big transport company stated that the supervision of pupils was an item on the agenda at a staff meeting.

To summarize, 15 of the teachers did not discuss OHS issues after the pupils' WPL. However, three teachers at three different programs used checklists, and report- and diary writing as tools to let the pupils account for after WPL. Eleven teachers visited the pupils at WPL. All 20 teachers wished to offer the supervisors training in their role.

None of the supervisors had received any information from the schools about what they should include in the introduction of the pupils at WPL. Moreover, none of them knew if the teachers discussed what the pupils had learned at WPL.

## 4. Discussion

The interviews with headmasters, teachers, and supervisors indicate a staggered picture of perceptions as to how the National Agency for Education intends for pupils to be prepared for work safety. The discussion is divided into the three research questions in the purpose of the study.

### 4.1. Headmasters' opinions of their roles

The headmasters, for the most part, give teachers the responsibility of finding ways to reach relevant goals. All headmasters had knowledge about the SWEM provision even if they had implemented it to a different extent. It is important to note that all of them had safety representatives among the pupils and regular staff meetings, which increased opportunities to inform pupils about OHS issues and to discuss them. It is rather remarkable that implementing SWEM in the schools as workplaces mostly had not increased the pupils' knowledge about OHS in their training [24]. Studies have shown that involving employees in work environment issues is an effective way to improve the work environment [28–30].

### 4.2. How teachers organize training

Aside from providing specific courses in OHS at the beginning of the 3-year training programs, the teachers, for the most part, organize their teaching based on their own experiences and knowledge. The choice of which training material to use is also, to a significant extent, at the discretion of the individual teacher. A few—but definitely not all—teachers search for available materials when planning a new class. Some consult with colleagues about the methods they use to teach the course. The teaching is very much

based on risk factors that are present in the workshops at school, where pupils have their practical training, or on the teacher's own experiences with accidents or incidents. In a review of 95 different methods of OHS training, Burke et al [14] found that more engaging methods, including active participation, resulted in an increase in pupils' OHS knowledge and a decrease in the number of work-related accidents and illnesses. Such pedagogic methods were missing in the participating schools.

Andersson et al [24] concluded in a previous study that pupils revealed a limited knowledge of the ways in which work environment management is supposed to be organized; the pupils expressed the belief that it is they themselves who are chiefly responsible for avoiding accidents and negative health effects from work. This is very much in line with how many of the teachers described their focus in OHS learning. To avoid risky situations and to use personal protective equipment were clearly in focus. How to do risk analysis and arrange for the control of risk factors was not the top priority. Training in performing risk analysis could be an effective way to improve the work environment as well as awareness of risks in the work environment and thereby decrease the potential for accidents for young workers. It would also probably increase the importance of implementing SWEM at workplaces.

#### 4.3. How training is organized as a part of WPL

A dominant part of the training is workplace-based; the selection of companies and supervisors, as well as the communication between school, teachers, and supervisors is therefore critical. This part of the training also lacks the systematic training in OHS as well as in the traditional classroom environment. Selection of companies is often a task to be undertaken by the teachers, with participation, at times, by the pupils. Many of the teachers made it clear that the biggest problem was to find a sufficient number of companies to meet the WPL needs and that it was therefore not realistic to place increased demands on the company or on the supervisors. Hodkinson [21] discusses the importance of good vocational education and training that includes OHS. He suggests a reward to raise the quality of WPL. One kind of reward is to establish an award for good WPL. One way to organize such an award could be to involve employers as well as employees' organizations. The supervisors in this study did not, for the most part, receive any benefits from the companies or the schools. Instead, the supervisors pointed out the importance of having the ability to test pupils prior to offering them further employment. Different examples of short courses aimed at supervisors were offered by some of the schools, but few accepted that invitation.

The communication between schools, teachers, and supervisors in the workplace is also an important part to achieve well-functioning training. The teachers normally visited the pupils and the supervisor at least once during the practice periods. The discussions then addressed how the pupil developed, with a focus on professional skills and normally not on safety. Winters et al [23] point out the significance of involving the pupil, the teacher, and the supervisor in a dialogue to discuss each pupil's learning and development. Jørgensen [22] describes the importance of combining the rationales of education in OHS for the three involved groups—pupils, schools, and WPL companies—to one common goal in order to make learning in OHS more useful.

The introduction of OHS issues in the WPL setting differed between the programs. Supervisors for pupils in industrial programs generally provided information about risks associated with the

machines. However, the supervisors had no information from the schools as to what issues should be included in the introduction of OHS discussion.

The result of this study, therefore, shows that the knowledge the individual pupil receives about OHS issues as related to their future work, depends—to a significant extent—on the individual teachers, as well as on the supervisors' personal knowledge and experiences, with little influence from the goal of the study plans. This is in line with an American study [10] that concluded that pupils' limited work experience is a barrier to raising OHS issues in WPL. Köpsén [18] points out the vocational teacher's need to have a vocational identity as well as formal teacher competence. The teachers in Köpsén's study believed that they had to make their pupils employable by teaching them the right skills and how to socially fit in at the workplace [18].

#### 4.4. Applying research to practice

To develop and thereby improve training in OHS in vocational education, headmasters could point out the importance of including training in SWEM for the pupils. The teachers' wish for more time to find new teaching material to develop their training in OHS must be taken seriously. One way to improve the supervisors' role could be to inform them about what pupils had trained for at school about OHS, but they should also be given enough time to discuss the content of OHS with teachers. It is remarkable that teachers did not discuss the pupils' experience of OHS at WPL when they are back in school again. This should be included in the training.

#### 4.5. Methodological considerations

The schools and workplaces for WPL were located in the middle part of Sweden, in towns or in rural areas, and thus can be considered to provide a spread in the material and therefore increase the credibility of the study. However, the geographic location of the study group was steered by the fact that the researchers wanted to follow up a study of pupils' knowledge on OHS. The study population was regarded as sufficient when the researchers concluded that saturation had been achieved and no further interviews were needed. The data were considered trustworthy, because the researchers first analyzed the interviews separately and then discussed the results to identify similarities and differences in the analyses. They also discussed the analyses with respect to how well the data and analyses addressed the aim of the study.

In this study, Swedish conditions were studied. Variations in national approaches must be considered as well as differences between countries.

Most of the headmasters perceived their role as school leaders by organizing a framework in which knowledge and regulation of a SWEM is an important part. However, teachers and supervisors did not plan the OHS training in accordance with the SWEM provision. Rather, the teachers based the training on their own previous experiences in the workplace. Most of the supervisors did not receive information from the schools as to what should be included in OHS issues at WPL. The introduction of new employees served, instead, as a model.

#### Conflicts of interest

No potential conflict of interest with respect to this article was reported.

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