



TAMPERE UNIVERSITY OF TECHNOLOGY



Työsuojelurahasto
Arbetskyddsfonden
The Finnish Work Environment Fund

Developing Process Safety Competence of Vocational Students

International Conference on Human Systems Engineering and
Design: Future Trends and Applications (IHSED 2018)

October 25-27, 2017

Champagne-Ardenne, France

Tappura, S., Nenonen, S. & Nenonen, N.
Center for Safety Management and Engineering
Tampere University of Technology
[sari.tappura\(at\)tut.fi](mailto:sari.tappura@tut.fi)

Introduction 1/2

- In the process industry, work is done using dangerous materials, under extreme conditions, and with high potential for major accidents
- Young and inexperienced workers typically encounter accidents more commonly than other employees
- Safety culture and competence are key performance determinants in the field of process safety, when automation systems and technologies become more complicated
- Skilled workforce is needed in the process industry
- New workers must be introduced to a safe working mode from the very beginning of their career



Introduction 2/2

- Workplace learning is essential when developing the safety competence of process operator students
 - The aim of process operator vocational education is to ensure that the students have sufficient process safety knowledge and competence
- Due to the Finnish vocational education and training (VET) reform, VET will be increasingly organized through workplace learning
- Close collaboration between workplaces, VET institutes, and students is found to be beneficial in increasing learning
- In-company trainers typically need support for guiding the students
 - Workplace learning requires reorganization and new methods



Objective

- Due to the safety-critical nature of the process industry and ongoing changes in the VET system, research and novel approaches are needed
- This study aims to fill this gap by surveying the current development needs regarding the guidance of workplace learning in the process industry with respect to the process operator vocational qualification



Materials and methods

Table 1. Summary of the participating organizations and data.

Companies (n=7)	Industry	Chemical and process industry
	Revenue	Between 11 and 13,217 million €
	Personnel	Between 38 and 5,297 persons
VET providers (n=5)	No. of students *	Between 1,400 and 18,000
	No. of employees *	Between 236 and 1,200
Interviews and workshop	Participants	Contact persons (n=16) at the organizations involved in the planning of workplace learning guidance
	Participants' job title	HR managers, development managers, HSEQ managers, education managers, and teachers
	Duration	Interviews of 30-60 minutes, one-day workshop

*Number of all students and employees, not only within the process industry.



Results

Category	Companies	VET institutes
Knowledge about the effects of the reform	Knowledge is too limited and clarification of procedures is needed	Criticism in companies due to misleading news and deficient information
Support of workplace guidance personnel	Detailed description of the role and guidance process needed	Realization of training varies, uniform model is required
Teachers' competence and resources	Better understanding of companies' needs and of the practical work life is required	Increasing teachers' practical training periods in the companies
Collaboration	Means and tools of communication need improving	
Understanding content of studies	Clarification of the competences of the students starting training is needed	Understanding of the students' learning requirements is needed
Responsibilities and agreements	Clarification of each party's different responsibilities is needed	Bureaucracy needs to be lowered
Congruent working practices (incl. safety)	Shared means between companies and VET would increase the skills of students	



Discussion

- The current VET reform causes uncertainty about the collaboration, because new procedures are still only in the developing phase
- The parties share insights about developmental needs, e.g.
 - support and training of both the guidance personnel in the workplaces and the teachers in the VET organizations with regards the reform
 - clarification of the studies' content (incl. safety issues) and the objectives of the workplace training
- Since the resources are limited both in the companies and at the VET providers, the progress of the developmental work requires increased collaboration and focus on the most critical and timely issues



Thank You!

