

Development of Labour Protection Competence for Specialists

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Abstract: The topicality of the development of labour protection competence for specialists is associated with an incomplete conformity of this competence with the protection of organizations or enterprises staff's life and health as well as promoting wellness. The aim of the study was to evaluate the dynamics of the development of the specialists' labour protection competence in the learning/studies process and work environment; improve competence in learning/studies and in the work environment of enterprises and organizations. In the data analysis nonparametric statistics – modes, medians and amplitudes were used. The significance of data differences (p value) was determined by the interactive calculation tool for chi-square tests. The upgraded competence development model components - knowledge, skills, attitude and intelligibility have been evaluated. Taking into account the assessment results, the specialists' studies as well as the enterprise or organisation staff's training have been improved. The methodological basis of the study included studies, analyses and evaluation of the relevant publications in the context of the competence of the specialists of healthy, sustainable and safe work. The reflection of the author's personal experience which was obtained through the working in an enterprise from 1980 to 2007, and teaching experience working as a teacher at Latvia University of Agriculture from the year 2008 till present has also been taken into account. According to the aim of the study the competence model components - knowledge, skills and attitudes with regard to values and dynamics of their development have been studied. The study conducted in the year 2016 lasted eight months. As a result of the study, the differences between the evaluation of the competence at the beginning and at the end of the study were found to be statistically significant ($p=0.00$).

Keywords: competences development, professional competence, specialists, adult education.

Introduction

One of the tasks in education in the 21st century is to ensure a sustainable development in society. In pursuing this goal, it is significant to ensure each society member's life and health and to promote life-long wellness. The activities of labour protection specialists and their adequate competence are of great importance in enterprises and organizations. The labour protection specialist should encourage each employee's and employer's personal responsibility for his or her performance, life, health and wellness both in the work environment and outside of it.

The labour specialist's task is to learn to improve him/herself, to develop his/her competence as well as motivate the personnel of the organisation/enterprise to develop the competences which ensure the preservation of life and health as well as wellness at work and after work. It is particularly important to change the employers' and employees' formal attitude to observing the rules of safe work in an organisation or enterprise, and by changing the employees' behaviour, to promote the increase in overall life expectancy (Brizga, 2016a), since competence is the ability to acquire and responsibly use knowledge, skills and attitudes in action, and there are certain criteria to be applied to judge about this ability (Briede, 2009) and its essence (Зимняя, 2004) is based on people's motivation, purposefulness, reflection and experience, the ability to mobilize willpower which manifests itself in all kinds of activities. The competence in education is associated with the process of continuity – initially the level of knowledge is based on the previous knowledge and finally it is the result which has been achieved.

In other studies competence is characterised as a specific knowledge organization type which allows one to make effective decisions in a corresponding field of activity (Холодная, 1997) since the characteristics of a subject's knowledge base is characterised by the subject's competence – a high level of competence requires a high level understanding of a problem and flexibility of its solution (Холодная, 2002). In the process of developing the competence criteria the individual intelligence, intellectual perception and development as well as experience in solving complicated problems should be taken into consideration. A particularly topical in the context of labour and civil protection is the scientist's notion regarding the difference between a competent specialist who knows a specific task and how to perform it and a specialist who knows and desires to perform a specific task but is not able to perform it.

Intelligibility in the context of labour protection specialists refers to qualitatively elaborated clearly understandable instructions, job descriptions and instructing. The study shows (Brizga, 2016a) that one of the reasons of formal attitude to labour and civil protection is the quality of instructions, since they are too long, complicated and difficult to understand.

The methodological basis of the study - studies, analyses and evaluation of the relevant publications (Ajzen, 1991; Armitage, Conner, 2001; Beck, Cowan, 2005; Briede, 2009; Cook-Greuter, 2000, 2004, 2005; Pfaffenberger, 2005, 2013; Smith, DeFrates-Densch, 2009; Wilber, 2007a, 2007b). The ideas generated from the works of these authors have been used to improve the programmes, teaching materials and methods.

Some suggestions have been stated regarding the importance of the programmes which are developed by the managers of enterprises or organisations to achieve the behaviour change of the management. It is purposeful to use the behaviour change theories (Daniellou, 2006; Eraut, 1994, 2004; Smith, Hogg, 2008; Zohar, 2004). The greatest challenges with regard to the programmes and chapters to be acquired are to include in them the topics dealing with the ways on how to change behaviour for ensuring a healthy life style (Glanz, Rimer, 2008). In the process of programme development and implementation it is very important to have cooperation of the managers of the enterprises and organisations with competent labour protection specialists who have acquired the competence required for the learning environment of the respective company and organisation.

Transformation of a personality based on culture, ethics and values has been analysed by the researchers of *Human development theories* (Beck, Cowan, 2005; Cook-Greuter, 2000, 2004, 2005; Wilber, 1996, 2000) pointing out that people have two life strategies: the scarifying strategy – changing oneself by adapting to the world or the expressive strategy – changing the world by adapting it to oneself as well as by changing the individual's persuasion based on values, the individual's behaviour/ action also changes (Wilber, 2007a, 2007b).

Labour protection specialists should organise labour and civil protection studies in such a way that the employers and employees would be motivated to use safe work techniques and carry out the self-evaluation of their behaviour. The study indicates that an individual's behaviour is shaped by an *intention* – the attitude to the anticipated results of behaviour and other persons' views about behaviour (Ajzen, 1991; Armitage, Conner, 2001; Godin, Kok, 1995). In adult education (Hoare, 2006; Pfaffenberger, 2005, 2013; Smith, DeFrates-Densch, 2009) self-development and self-effectiveness in intellectual development process play an important role.

In the study process the discussions with both teaching staff and students about the experience gained are very important. The evaluation and self-evaluation of competence facilitate acquiring of self-assessment skills (Ross, 2006; Ross, Bruce, 2007). Reflection facilitates students' understanding about their pedagogical activities (Davis, Dargusch, 2015; Ferguson, 2011). In order to carry out the evaluation of skills it is necessary to develop the criteria of self-evaluation (Grant, 2014).

Basing on the theoretical analysis it has been stated that:

The competence of labour protection specialists in order to perform safe and sustainable work, which is non-harmful to health, includes the components of attitude, skills, knowledge and intelligibility. It develops and improves in action – as interaction between individual abilities and the social environment.

Knowledge, skills, attitudes and intelligibility are the components of competence; therefore, the following assessments were applied for expert evaluation.

Attitude –as tolerant, positive, consistent and responsible attitude towards promoting labour which is safe, sustainable and non-harmful to health, responsibility for one's words and actions; responsibility to one's partners, critical approach to the existing attitude of society members to the observance of labour protection rules, minimising the formal attitude to these rules; respect to different views and diversity of views; objective and considerate evaluation and characterisation of accidents and observing confidentiality.

Knowledge – the labour protection specialists understands occupational health and labour medicine, promotion of wellness, protection of the surrounding environment, management sciences, economics,

business IT, record keeping, rules and regulations of labour protection, work environment risk assessment and management, choice of labour protection means, ergonomics, fire safety and civil protection, work psychology and pedagogy, organisation of learning and instructing process, developing of the required methodological materials in the context of safe and sustainable work which is non-harmful to health.

Skills - the labour protection specialists is able to teach classes in labour and civil protection, reducing the formal attitudes in society towards labour and civil protection, running workshops on work safety education for development of one's knowledge, skills and competence.

Intelligibility – the ability to comprehensibly, according to the knowledge level of a certain learner or that of a learning group, demonstrate and explain safe work techniques which are sustainable and non-harmful to the employee's health, as well as to design understandable methodological materials and instructions.

Competences - the labour protection specialists are able to independently formulate, critically analyse and predict the development of labour safety system which is safe, sustainable and non-harmful for health. They are also able to solve problems, substantiate decisions and take part in the implementation of tasks, integrating the knowledge of other fields, contribute to the generation of new knowledge in the development of methods of research or professional activities. They are able to show understanding and ethical responsibility for the possible impact of science results or professional activities on the environment and society. They use the acquired knowledge in the process of the development of the study course and diploma paper. The labour protection specialists are able to assess the quality of training and instructions and improve them.

The aim of the study was to evaluate the dynamics of the development of specialists' labour protection competence in the learning/studies process and work environment; improve competence in learning/studies and in the work environment of enterprises and organizations.

Methodology

The methodology of study is based on the specialists' competence improvement model (Brizga, 2016b) updated in the study. In the current study four components were chosen for its characterisation (Table 2) - *Knowledge, Skills, Attitude and Intelligibility*. In the study carried out in the previous year 3-level (Brizga, 2016a) or 10-level (Brizga, 2015) scales were used. The distributions of data obtained by the 10-level scale are bimodal and it is not possible to accurately determine the mean parameters. The evaluators can't always differentiate the differences of 10 ranges. The current study uses a 4-level scale (Table 1; 2; 3).

In the previous (Brizga, 2015) study the competence level was determined only during the first and second class with a week's break where the competence development opportunities were minimal. The duration of the current study was 8 months and the competence was evaluated 5 times (Table 2; 3). The evaluations during the practice period were particularly significant. Not only self-evaluations alone were used to characterise the competence, but they were adjusted according to practice consultants' observations, students' written reports and the results of the exams.

Within the context of the study it means to improve the trainee's competence and improve the experience of organization's or enterprise's personnel so that healthy, safe and sustainable work can be carried out. According to the behaviour change theories (see *Introduction*) the managers of enterprises and organizations should develop programmes to achieve the behavioural changes with the purpose to ensure a healthy life style. The trainees' task is to take an active part in this process.

The evaluation and self-evaluation of competence, competence survey, unstructured observations, expert evaluations and experience reflection were used. In the data analysis nonparametric statistics – modes, medians and amplitudes were used. The significance of data differences (p value) was determined by the interactive calculation tool for chi-square tests (Preacher, 2001).

The study was conducted from February to October, 2016. The data of the study were obtained from 19 industrial enterprises or organisations with the total number of employees – 1122 and also Latvia University of Agriculture. The participants of the study were 19 specialists studying part-time in the programme “*Labour protection and occupational safety*” and who directly took part in the learning and instructing process of 649 people. The specialists of these enterprises who implement labour protection measures also took part in the study.

Results and discussion

The results of the study are shown in three tables. The following descriptors were used in the tables: *S* – at the beginning of the session, *F* – at the end of the session, *SP* – at the beginning of the practice, > at the end of the session the evaluation is higher than at the end, = the evaluation has not changed.

Table 7

Labour protection students' competence development evaluation

Nr.	Knowledge		Skills		Attitude		Intelligibility		Competence	
	<i>S</i>	<i>F</i>	<i>S</i>	<i>F</i>	<i>S</i>	<i>F</i>	<i>S</i>	<i>F</i>	<i>S</i>	<i>F</i>
<i>Competence evaluation level: 1 – min; 4 – max</i>										
1.	2	3	2	2	2	2	3	3	2	2
2.	2	3	2	2	2	3	2	3	3	3
3.	1	3	1	3	1	3	2	4	1	3
4.	3	3	3	3	3	3	4	4	3	4
5.	2	3	2	2	2	3	3	3	3	3
6.	2	3	3	4	2	3	3	4	2	3
7.	3	3	3	3	3	3	3	3	3	3
8.	2	2	2	2	2	2	3	3	2	2
9.	2	3	2	2	2	3	3	3	3	3
10.	1	2	3	3	2	3	3	3	2	3
11.	1	2	1	2	2	3	4	4	3	3
12.	3	4	3	3	3	4	4	4	4	4
13.	1	2	1	2	2	2	2	2	2	2
14.	2	2	2	2	2	2	3	3	2	3
15.	1	2	1	2	2	2	2	2	2	2
16.	2	3	2	2	2	2	2	2	1	2
17.	1	2	1	2	2	3	3	2	1	2
18.	2	3	2	3	1	2	3	3	2	3
19.	2	3	2	3	2	3	2	3	2	3
Data analysis										
Level	Knowledge		Skills		Attitude		Intelligibility		Competence	
	<i>S</i>	<i>F</i>	<i>S</i>	<i>F</i>	<i>S</i>	<i>F</i>	<i>S</i>	<i>F</i>	<i>S</i>	<i>F</i>
<i>Distributions of data</i>										
1	6	0	5	0	2	0	0	0	3	0
2	10	7	9	11	14	7	6	4	9	6
3	3	11	5	7	3	11	10	10	6	11
4	0	1	0	1	0	1	3	5	1	2
<i>1+2</i>	<i>16</i>	<i>7</i>	<i>14</i>	<i>11</i>	<i>16</i>	<i>7</i>	<i>6</i>	<i>4</i>	<i>12</i>	<i>6</i>
<i>3+4</i>	<i>3</i>	<i>12</i>	<i>5</i>	<i>8</i>	<i>3</i>	<i>12</i>	<i>13</i>	<i>15</i>	<i>7</i>	<i>13</i>
<i>Descriptive statistics</i>										
<i>M_o</i>	2	3	2	2	2	3	3	3	2	3
<i>M_e</i>	3	3	2	2	2	3	3	3	2	3
<i>A</i>	3	2	3	3	3	3	3	3	4	3
<i>Σ</i>	35	51	38	47	39	51	54	58	43	53
>	16		8		12		9		10	
=	3		11		7		10		9	

Table 2

Labour protection students` competence components development evaluation (1)

Level	Data analysis									
	Knowledge					Skills				
	S	F	SP	S	F	S	F	SP	S	F
	<i>Distributions of data</i>									
1	6	0	0	0	0	5	0	0	0	0
2	10	7	2	0	0	9	11	6	0	0
3	3	11	16	12	4	5	7	12	14	7
4	0	1	1	7	15	0	1	1	5	12
<i>I+2</i>	<i>16</i>	<i>7</i>	<i>2</i>	<i>0</i>	<i>0</i>	<i>14</i>	<i>11</i>	<i>6</i>	<i>0</i>	<i>0</i>
<i>3+4</i>	<i>3</i>	<i>18</i>	<i>17</i>	<i>19</i>	<i>19</i>	<i>5</i>	<i>8</i>	<i>13</i>	<i>19</i>	<i>19</i>
	<i>Descriptive statistics</i>									
<i>M_o</i>	2	3	3	3	4	2	3	3	3	4
<i>M_e</i>	2	3	3	3	4	3	3	3	3	4
<i>A</i>	3	3	3	2	1	3	2	2	1	1
Σ	35	51	56	64	72	38	47	52	62	69
Level	Attitude					Intelligibility				
	S	F	SP	S	F	S	F	SP	S	F
	<i>Distributions of data</i>									
1	0	0	0	0	0	3	0	0	0	0
2	6	4	2	0	0	9	6	2	0	0
3	10	10	13	9	2	6	11	15	12	5
4	3	5	4	10	17	1	2	2	7	14
<i>I+2</i>	<i>6</i>	<i>4</i>	<i>2</i>	<i>0</i>	<i>0</i>	<i>12</i>	<i>6</i>	<i>2</i>	<i>0</i>	<i>0</i>
<i>3+4</i>	<i>13</i>	<i>15</i>	<i>17</i>	<i>19</i>	<i>19</i>	<i>7</i>	<i>13</i>	<i>17</i>	<i>19</i>	<i>19</i>
	<i>Descriptive statistics</i>									
<i>M_o</i>	3	3	3	4	4	2	3	3	3	4
<i>M_e</i>	3	3	3	4	4	2	3	3	3	4
<i>A</i>	3	3	3	2	2	4	3	3	2	2
Σ	54	58	59	67	74	43	53	57	64	71

Table 3

Labour protection students` competence development evaluation (2)

Level	Data analysis				
	S	F	SP	S	F
	<i>Distributions of data</i>				
1	2	0	0	0	0
2	14	7	4	0	0
3	3	11	14	12	4
4	0	1	1	7	15
<i>I+2</i>	<i>16</i>	<i>7</i>	<i>4</i>	<i>0</i>	<i>0</i>
<i>3+4</i>	<i>3</i>	<i>12</i>	<i>15</i>	<i>19</i>	<i>19</i>
	<i>Descriptive statistics</i>				
<i>M_o</i>	2	3	3	3	4
<i>M_e</i>	2	3	3	3	4
<i>A</i>	3	3	3	2	2
Σ	39	51	54	64	72

Analysing the evaluation sums (Σ) of competences (Table 3) statistically significant ($p=0.00$) differences between the evaluation sum at the beginning of the study (39) and at the end of it (72). The differences in evaluation sums of the first session (39 and 51) are not statistically significant ($p=0.21$). The differences in evaluation sums of the second session (64 and 72) are also not statistically significant

($p=0.21$). At the end (**F**) of the session higher evaluation ($>$) than at the start (**S**) is in 55 (58%) cases and it had not changed ($=$) in 40 (42%) cases (Table 1). In a similar study in the previous study year (Brizga, 2015, 22) with another group of students at the end of the session the highest evaluations were in 37.5% of cases, the lowest in 37.5% and in 25% of cases they remained unchanged.

For the implementation of a healthy, safe and sustainable work of the competence, it is particularly important to develop the component - *attitude*. Carrying out the evaluations of the development of attitude and self-evaluations it was established that the attitude improved in 33% of cases, partly improved in 49% of cases (in total 83%) and remained unchanged in 18% of 649 people. The attitude became worse in one employee who considered that the studies and instructions followed by the examination of the acquired knowledge were too time consuming. A regular formal signing of the document approving the fact that the instruction has taken place will suffice. In seven enterprises there were not more than 16 workers in each, therefore when observations were carried out, it was established that self-evaluation corresponded to real changes in their attitude.

A detailed competence development evaluation took place in the case study of four enterprises. The number of employees who participated in the study and whose competence had increased was 250. Comparatively higher were the changes in knowledge and skills, since the initial evaluation of attitudes was closer to the highest.

Simultaneously a significant competence development in the work environment had taken place also among the specialists acquiring the part-time study programme *Labour protection and occupational safety*. The sum of the evaluations had increased (Table 3) from 54 to 72 ($p=0.095 < p=0.10$).

The competence development of the enterprises' or organisations' personnel has been positively influenced by the improvement of the premises and time of instructions as well as the improvement of the methodology – the organisation of training premises and display of the teaching aids in these premises, studies during the first part of the day, exercising during work breaks at the work place, using IT and video materials and actualisation of discussions, as well as cooperation among the top level managers and department managers, labour protection and other specialists of business enterprises.

While carrying out the theoretical and experimental study the consistently used Latvian term *darba aizsardzība* (*labour protection*) - not appropriately reflecting the essence of the meaning – caused some difficulties. It is the individual who must be protected by creating and developing a healthy, safe and sustainable work environment and process.

Conclusions

Evaluating the development dynamics of the competences of the specialists of enterprises or organisations for the implementation of healthy, safe and sustainable work, it was stated that:

- a significant improvement of competence has taken place – the difference between the evaluation of competence at the beginning of the study and at the end is statistically significant ($p=0.00$);
- improving the personnel's competence – knowledge, skills and attitude in the work environment, the development of its most significant component - attitude in 83% of those 649 study participants working in enterprises or organisations has taken place; simultaneously in the work environment a significant development of competence ($p = 0.095$) has taken place among the specialists involved in the part-time study programme *Labour protection and occupational safety*;
- the competence development of the enterprises' or organisations' personnel has been positively influenced by the improvement of the instruction premises and time as well as the improvement of the methodology – the organisation of special training premises, learning during the first part of the day, exercising during work breaks, using IT and video materials, actualisation of discussions, as well as cooperation among the top level managers and department managers, labour protection and other specialists of enterprises;
- further study is recommended in order to improve the competence development model for labour protection specialists and the learning and study programmes based on it, as well as the terminology.

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