Improving job satisfaction with different intervention methods among the school personnel in Estonia and Latvia

G. Hrenov[1], I. Vilcane[2], V. Urbane[2] and P. Tint[1,*]

[1]Tallinn University of Technology, Faculty of Economics, Institute of Business Administration, Ehitajate 5, EE19086, Tallinn, Estonia
[2]Riga Technical University, Faculty of Engineering Economics and Management, Institute of Labour Safety and Civil Defence, Kalku street 1, LV-1658, Riga, Latvia
*Correspondence: piia.tint@ttu.ee

Abstract. This investigation was carried out in two high schools: one in Estonia (EST1) and one in Latvia (LAT1). The offices EST2 and LAT2 were chosen from the countryside of the both countries. Office EST1 is situated in an atrium-type building for educational and research needs. The second building is mainly for education (auditoriums) and the offices LAT1 are situated on the ground floor. The third and the fourth offices were taken for comparison. Office EST2 is situated in a countryside in an old wooden building; the fourth office LAT2 is located in a new building in Latvian countryside. All together 181 office-workers were involved. At first, the work environment conditions were measured. The ergonomics of workplaces was assessed with ART-tool and Kiva-questionnaire was used to study psychosocial conditions and job satisfaction at computer-equipped workplaces. Occupational hazards were measured to clarify, do the work environment influence on the behaviour and the job motivation and satisfaction of the worker at workplace? After the first questioning of workers using Kiva-questionnaire, the Metal Age programme was implemented and after the intervention, the Kiva-questionnaire was carried out again. The results showed that if the preventive measures for solving the problems at workplace are implemented, and the employers and the employees are trained and consulted using the appropriate programmes, the stress situations could be avoided. The workers in all offices were confident that the discussion about the problems is very important as the work with computers is intensive and there is a very short time to communicate with each other. The educational work is also stressful.

Key words: work conditions, ergonomics, computer-use, psychosocial climate, high-schools.

INTRODUCTION

In theory, there are many definitions and explanations for job satisfaction. Locke (1976) defines job satisfaction as a pleasurable or positive emotional state that is related to the work that the individual performs. The satisfaction with working conditions produces a positive influence on teachers' retention (Kearney, 2008). Some of the authors indicate that the salary mainly influences on teachers' satisfaction (Hughes, 2012), but the other studies show only a slight effect (Ondrich et al., 2008). Many researchers have concluded that the main source of job satisfaction for teachers does not originate from the salary, but from the interpersonal relationships that teachers

experience with administrators, other teachers, and students (Butt et al., 2005; Maele & Houtte, 2012; Bozeman, 2013). Additionally, teachers' satisfaction with school working conditions has shown influence both, on job satisfaction and retention (Mont & Rees, 1996; Weiss, 2002; Borman & Dowling, 2008).

One of the challenges for the business is to satisfy its employees in order to cope up with increasingly changing and evolving environment and to achieve the success and remain in competition (Raziq & Maulabakhsh, 2015). In order to increase efficiency, effectiveness, productivity and job commitment of employees, the business must satisfy the needs of its employees by providing good working conditions. The results of this study indicate a positive relationship between the working environment and the employees' job satisfaction. Job satisfaction is an orientation of emotions that employees possess towards role they are performing at the work-place (Vroom, 1964). Clark (1997) argues that if employees are not satisfied with the task assigned to them, they are not certain about factors such as their rights; working conditions are unsafe, co-workers are not cooperative, supervisor is not giving them respect and they are not considered in the decision making process. Resulting of that they feel themselves separated from the organization. The employees' morale should be high as it will be reflected in their performance. With low morale they will make lesser efforts to improve (Clark, 1997).

The working environment consists of two broader dimensions such as work and context. Work include all the different characteristics like the way how the job is carried out and completed, involving the tasks like task activity training, control on one's own job related activities. Spector (1997) observed that most business ignore the working environment within their organization resulting in an adverse effect on the performance of their employees. The second dimension of job satisfaction are physical working conditions and the social working conditions (Sousa-Poza & Sousa-Poza, 2000; Gazioglu & Tanselb, 2006; Skalli et al., 2008).

Babin & Boles (1996) argued that the supervisory support and the worker's involvement decreases the work stress; it is helpful in increasing job satisfaction and job performance.

Studies that consider the working conditions, physical overload and psychosocial risk factors are complex and have not been conducted in Estonia until now. The results of the investigation of the work environment in Latvia are presented in the scientific papers of Gravele et al. (2013), Lakisa et al. (2013), Martinsone et al. (2013) and Sprudza et al. (2014).

The results of the current paper are very important, offering ideas for the further research to improve of the psychosocial work environment. The results could also be implemented in other post-socialist countries as the early stage in the work environment was almost the same for all of these states.

The research question: is it possible to reduce the physical and psychosocial risk at workplaces by speaking with people, training them and solving the problems regarding the issues of their complaints? Different hazardous factors (indoor climate, psychosocial factors, static posture etc.) are influencing the computer-workers (Weiss, 2002; Tint et al., 2012). If the improvement methods in the working environment are implemented, the level of stress of workers has to be decreased.

The aim of the study is to compare the disturbing factors and find the solutions for improving the job satisfaction in different countries high schools workers' (Estonia, Latvia).

MATERIAL AND METHODS

The office-rooms of the high school workers and accordingly the working conditions in these rooms in Estonia and Latvia were chosen as the buildings are very different: the work-premises in Estonia are located in the atrium-type building and in Latvia in the ordinary multi-storey building. The atrium-type house is energy-efficient, but the working conditions might be complicated (the problems caused by the shortage of the natural lighting and/or ventilation). Therefore, the complaints with working conditions are different in these two types of buildings.

The psychosocial character of computer workers' health risks in modern- and general-type buildings is investigated. Nowadays, different type of modern glazed buildings are used for office work. These buildings create good lighting conditions as people feel themselves connected with the nature, but there sometimes also arise some disturbing problems, like high temperature in summer, high concentration of carbon dioxide etc. The influence of indoor climate conditions on development of health damages at workplace are also taken into consideration. The computer workers (accountants, secretaries, etc.) often work in a static posture. The most injured regions of the body were the right wrist and the neck. The work conditions (indoor climate, lighting) are closely connected with the development of the musculoskeletal disorders (MSDs). Low temperature (< 20 °C in office) in winter and high temperatures and draught in summer; deficiency of day-lighting etc. are supplementary factors for developing the MSDs. MSDs of the computer professionals are associated in addition to the individual factors also with the organizational factors like the length of the rest breaks, rotation, printing and sitting duration of the worker and with the factors related to the workplace (the possibility to regulate the work chair and work table; the placement of the screen, keyboard and mouse) (Surakka, 2014). The Metal Age programme (Näsman, 2011) is energy-effective, but the working conditions are complicated as used. A Kiva-questionnaire was forwarded to the workers by the Internet or as a copy before the intervention of the Metal Age programme. 181 office-workers (including high school workers) from Estonia and Latvia were interviewed about the health risks and health disturbances connected with their work. The health disturbances were specified. The development of MSDs connected with office work are dependent on the ergonomics of the workplaces. The programme was carried out during winter and spring season.

The assessment of the ergonomics of the workplaces (ART-tool)

In the current study, the risk level of office-workers was assessed using the ART tool (HSE, 2007). In 2007, the Health and Safety Executive (HSE) presented the prototype of a tool for risk assessment of repetitive tasks of the upper limbs. The technical content of the ART tool draws upon earlier work to develop the occupational repetitive actions methods (Colombini et al., 2002) and Quick Exposure Check (David et al., 2008). As a result, the ART tool (Pille et al., 2016) examines twelve risk factors that have been grouped into four stages: (1) frequency and repetition of movements; (2) force; (3) awkward postures (of the neck, back, shoulder/arm, wrist and hand); (4) additional factors (which include the aspect of task duration, recovery, perceived work pace and other object and work environment factors).

The result is the sum of the four stages: A, B, C and D. These stages are divided into sub-stages A1 – arm movements (infrequent: score 0; frequent: 3; very frequent: 6); A2 – repetition (10 times per minute or less: score 0, 11–20 times per minute: 3, more than 20 times per minute: 6); B – force (light force: score 4, moderate force: 6, strong force: 8, very strong force: 12); C1 – head/neck posture (in an almost neutral posture: 0, bent or twisted part of the time (e.g. 15–60): 1; bent or twisted more than half of the time (more than 50%): 2); C2 – back posture (in almost neutral position: 0, bent forward, sideways or twisted part of the time: 1, bent forward, sideways or twisted for more than half of the time: 2); C3 – arm posture (kept close to the body or supported: 0, raised away from the body part of the time: 2, raised away from the body more than half of the time: 4), C4 – wrist posture (almost straight/in a neutral position: 0, bent or deviated part of the time: 1, bent or deviated more than half of the time: 2); C5 – hand/finger grip power grip or do not grip awkwardly: 0, pinch or wide finger grip for part of the time: 1, pinch or wide finger grip for more than half of the time: 2); D1 – breaks less than one hour: 0, 1–2 hours: 2, 2–3 hours: 4, 3–4 hours: 6, 4 hours or more: 8); D2 – work pace (not difficult to keep up with the work: 0, sometimes difficult to keep up with the work: 1, often difficult to keep up with the work: 2); D3 – other factors (less than 2 hours: x 0.5, 2–4 hours: x 0.75, 4–8 hours: x1, more than 8 hours: x 1.5; Eq. 1). The body postures (in graphical mode) and conditions (by time) are given (Colombini et al., 2002). The total score is calculated by the equation 1 (Pille et al., 2016):

$$\text{Task score} = A1+A2+B+C1+C2+C3+C4+C5+D1+D2+D3 \qquad (1)$$

If you assess both arms, the scores for the left arm and right arm should be kept separate and not combined.

The calculation of the exposure score (risk level) is achieved when the task score is multiplied by the duration multiplier (Eq. 2).

$$\text{Task score x Duration multiplier} = \text{Exposure score} \qquad (2)$$

Task scores and exposure help prioritise tasks that need most urgent attention and help check the effectiveness of any improvements.

The system for interpreting the exposure score is proposed in Table 1.

Table 1. Risk levels depending from the scores

Exposure score	Proposed risk level	Action needed
0–11	low	Consider individual circumstances
12–21	medium	Further investigation required
22 or more	high	Further investigation required urgently

Metal Age programme
The Metal Age method aims to create concrete, practical and tailored solutions to improve the relations in the workplace. The approach consists of four phases:

1) Orientation phase – the matrix shows the situation at the work unit from three different point of view; the individuals', the work units and organizations;

2) Intervention planning phase aims to find the development areas for improving the well-being at work for the Metal Age planning group. At this stage the participants should evaluate the development areas freely and list the development areas before grouping them together;

3) Prioritization phase – which challenges are the most important and urgent. A crucial part of the planning process of the Metal Age method is prioritization. Without emphasizing, there is risk that the working place only lists a number of development areas. Further, the list may became so extensive that there are not enough resources and nothing will be done;

4) Suggestion phase – suggestions for concrete actions. The phase for establishing concrete actions begins after finalization of the score setting in the prioritization phase. Concrete actions are agreed on for the development area that had the highest score during prioritization;

5) Follow-up phase (Kiva-questionnaire). The Metal Age planning session is concluded by the group agreeing on follow-up meeting held after some months.

The Kiva-questionnaires

Kiva-questionnaire characterizes the wellbeing and job satisfaction of workers at work. The ratings were given in a 10-point scale (1- not at all, 10- very much so, certain or well). The Kiva-questionnaire was composed of seven questions:

1. Have you enjoyed coming to work in the last weeks?
2. I regard my job meaningful.
3. I feel in control of my work.
4. I get on with my fellow-workers.
5. My immediate superior performs as superior.
6. How certain are you that you will keep the job with this employer?
7. How much can you influence factors concerning your job?

The Kiva-questionnaire after the Metal Age programme implementation was conducted with the same 181 persons selected from four institutions (from those most interested in co-operation and improvements in the working environment).

Measurements of working conditions

The indoor air conditions were measured using the following standards and measuring equipment: EVS-EN-ISO 7726:2003 'Thermal environments- Instruments and methods for measuring physical quantities'; EVS-EN 15251:2007 'Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics', EVS-EN 12464-1:2011 'Light and lighting- Lighting of workplaces- part 1: Indoor work places', EVS 891:2008 'Measurement and evaluation of electrical lighting in working places', ISO 16000-26:2012 'Indoor air- Part 26 Sampling strategy for carbon dioxide (CO_2)', LVS EN 12464-1:2011 'Light and lighting- Lighting of work places- Part 1: Indoor work places', LVS EN ISO 7726:2004 L 'Ergonomics of the thermal environment- Instruments for measuring physical quantities', Labour Protection Requirements in Workplaces (Latvia, 2010).

The measurement equipment used for microclimate: TESTO 435. TESTO 435 enables also the measurements of CO_2. Workplaces lighting and and screens were measured using the light-metre TES 1332 (ranges from 1-1500 lx). The lighting was measured on the worktable, on the screen and on the keyboard. Dust was measured with HazDust EPAM-5000. EPAM-5000 is a portable air monitor designed for measuring trace level for ambient air pollution. The unique sampling design allows for real-time data and filter gravimetric analysis directly behind the optical sensor. EPAM-5000 offers

a weather tight carrying case, temperature compensated electronics, easy to clean optical sensor and a standard 24 hour battery or continuous sampling with solar power panel accessory.

Statistical analysis

The arithmetic mean and standard deviation (SD) were calculated (Kiva-questionnaire). In ART-tool the statistics is taken into consideration in the method (Colombini et al., 2002).

RESULTS

Measurements in the work environment

Table 2 shows the results of measurements in the work environment. In winter the humidity of the air is too low. By the norms (EVS-EN 15251:2007), the relative humidity of 40–60% is required for the worker to feel comfort. The level of carbon dioxide ~1,000 ppm is felt by the workers as poor work environment air. The lighting of workplaces equipped with computers is usually good, in the frames of norms (300–500 lx), but sometimes info technologists prefer working in dark (without electrical lighting). However, this situation has to be avoided.

Table 2. Results of measurements indoors in offices (during 2016)*

Room type	T, °C Cold/ warm season U = 0.6°C	R, % Cold/ warm season U = 2.05	L, lx U = 10.4%	CO_2, ppm U = 10%	Dust, mg m⁻³ U = 10%
Office EST1	20–23 / 25–28	25–27 / 40–70	595–790	537–988	0.020
Office LAT1	20–22 / 24–28	15–25 / 35–75	500–550	503–740	0.025
Office EST2	18–22 / 20–24	20–30 / 40–74	450–550	450–1,210	0.015
Office LAT2	17–20 / 22–28	15–30 / 40–70	500–610	470–1,102	0.012

* Outdoor temperature during the measurements in cold season was – 5 to 1 degrees; in warm season it was 18–22 degrees; the humidity of the air during cold season was 40–80%; during the warm season 60–90%. U – the uncertainty of measurements; T – temperature of the air; R – relative humidity; L – lighting; CO_2 – concentration of carbon dioxide in the air; Dust – dust concentration in the air.

The assessment of the ergonomics of the workplaces

The results of the assessment (Table 3) show that office workers' risk level is medium (14–19.2). Office EST2 located in a country-side had high risk level on the right hand (too much working with computer, not following the rules about breaks, bad ergonomics of the workplace).There is a difference in the risk level of the left and right hand for the office-workers.

The risk scores by the ART-tool (Colombini et al., 2002) are determined separately for the right and left hand. The difference is assigned during the each individual case according to the standardized methodology described previously and presented under the Table 3.

Table 3. Assessment of monotonous work and/or in static posture by means of the ART tool (presented in Table 1) in offices

Work-place	Left/right (L/R) part of the body	A1/A2 0…6**	B, 0…12	C1/C2 0…2	C3/C4 0…4 / 0…2	C5/D1 0…2 / 0…8	D2/D3 0…2	D4 0.5…1.5	Risk* level
Off.	L	1/2	4	1/1	0/1	0/1	1/2	1	14
EST1	R	3/3	4	1/1	0/1	0/1	1/2	1	18
Off.	L	1/2	4	1/1	0/1	0/0	1/2	1.2	15.6
LAT1	R	3/3	4	1/1	0/1	0/0	1/2	1.2	19.2
Off.	L	2/3	4	1/2	1/1	1/1	0/1	1	17
EST2	R	2/3	4	1/2	2/2	1/2	1/2	1	22
Off	L	1/2	4	1/1	0/1	0/1	1/1	1	14
LAT2	R	2/2	4	1/1	1/2	1/2	1/2	1	19

*Risk level: 0–11 = low risk; 12–21: medium risk; 22 or more: high risk level; ** 0...6 – the numbers indicate the min and max of the assessment scale.*

Responses to the Kiva questionnaire

The Kiva questionnaire was conducted twice: before the intervention of the Metal Age programme and after it (Table 4). The number of used questionnaires was 62 in office EST1, 67 in office LAT1, 35 in office EST2 and 17 in office LAT2. According to the Kiva questionnaire, the investigated workers had high satisfaction coefficients with work. In addition, the stress indicators did not evaluate the stress-levels high. Kiva methodology for deploying a team is intended to find solutions to the specific results of the work of the team. It is connected with the character of work to find suitable working arrangements to be developed and therefore it is suitable for work-related psychosocial and MSDs prevention.

Table 4. Responses to the Kiva questionnaire

The question	Office 1, EST1 B(SD)/A*(SD)	Office 2, LAT1 B(SD)/A(SD)	Office 3, EST2 B(SD)/A(SD)	Office 4, LAT2 B(SD)/A(SD)
1	6.5(2)/7.6(3)	7,85(2)/7.9(1)	7.5(3)/7.4(2)	6.125(3)/7.85(2)
2	7.7(1)/7.95(2)	8.27(3)/8.1(1)	7.0(1)/7.2(2)	8.37(3)/7.8(2)
3	8.1(1)/7.9(3)	6,56(3)/7.5(2)	6.5(3)/6.8(2)	8,1(3)/7.6(2)
4	8.95(1)/8.7(2)	7,3(2)/8.5(1)	7.5(2)/7.4(2)	7,9(2)/8.65(3)
5	6.8(2)/8.1(3)	5,68(2)/7.8(1)	6.5(2)/6.7(2)	6,46(3)/6.5(2)
6	7.4(1)/7.5(2)	7,83(3)/7.6(2)	6.5(1)/7.2(2)	7.82(3)/7.9(2)
7	6.8(2)/7.3(1)	7,2(1)/6.4(1)	6.5(1)/6.5(2)	6,8(2)/7.6(1)

B/A – the mean values before the Metal Age intervention/ after the Metal Age intervention.*

The changes in the Kiva questionnaire in offices are shown in Table 4. The relations between the employer and the employees were usually improved (questions 1–2, 5–7). A slight decrease appeared in questions 3: Does your immediate superior help you develop your skills? To the fifth question: 'My immediate superior performs as superior?' the answers showed the lowest score at the beginning of the investigation. After the Metal Age programme implementation, the scores were arisen considerably. It means that the management behaviour has to be improved. The managers have to undergo advanced training in management ingredients.

Prevention and rehabilitation

The proposals were given for ergonomic improvements at workplaces (new ergonomic chairs, the possibility to change the height of the worktable; the change of the situation of a monitor etc.) during the Metal Age intervention. The complaints in the air of the work environment and lighting deficiency complaints were reported to the employer. The rehabilitation of MSDs are possible using balneological methods of treatment and methods of physiotherapy (Tuulik et al., 2013).

DISCUSSION

The work environment can be described as the whole surrounding where the person is working. Working environment has a positive impact on the job satisfaction of employees. Bad working conditions restrict employees to portray their capabilities and attain full potential, so it is imperative that the business realize the importance of good working environment.

Kinzl et al. (2005) concluded that job satisfaction has positive relationship with opportunities provided to employees by the organization. These results were also proven by the authors of the current paper. The previous studies of the authors of the current paper (Pille et al., 2015) showed, that if the workers are divided into two groups (< 40 and 40 and over years), the health status is not straight dependent on the age, particularly for computer-workers. The main reason of deteriorating health of younger people is the sedentary work position and the start of with work with computers in younger and younger age. In the research of Bojadijev et al. (2015), the results indicate that the age of employees is the most powerful predictor of job satisfaction. This conclusion has to be connected to the health status of the worker. A satisfied and healthy employee is the biggest asset of any organization. Effective results and productivity for any organization is dependent on the level of the satisfaction of the employees.

The organization has to motivate their employees to work hard for achieving the organizational goals and objectives. The paper of Raziq & Maulabakhsh (2015) also encourages people to contribute more to their jobs and the management has to help the workers in their personal growth and development. They have conducted correlation analysis to determine the relationship of working environment components (i.e. top management, esteem needs and work hours, and job security, safety and workplace relationships) and job satisfaction. Eleven work environment factors controlling personal and job characteristics are involved into the model. The regression result reveals that work environment has a statistically significant impact on job satisfaction. The work environment is one of the most important factors, which influence on the satisfaction and motivation level of the employees (Jain & Kaur, 2014). Effective work environment encourage the happier employee with their job that ultimately influence the growth of an organization as well as growth of an economic: 71% of the employees said that they get proper health and safety facility whereas, 29% employees feel they do not get proper facilities in the working place (Jain & Kaur, 2014).

The findings of Tella et al. (2007) study reveal that the correlation between perceived motivation and job satisfaction is positive. Job satisfaction is a result of employee's perception of how well their job provides those things that are viewed as important. Bakotic & Babic (2013) found that for the workers who work under difficult working conditions, consider the working conditions as important factor for job

satisfaction. So the workers under difficult working conditions are satisfied through the improvement of this factor. This will make them equally happy. Work environment performs to have both positive and negative effects on the psychological state and welfare of employees. The office workers in Estonia and Latvia (mainly teaching staff) are satisfied with the working conditions, but in the country-side the conditions in offices (not educational) have to be improved.

CONCLUSIONS

Good working environment has an enormous impact on the job satisfaction of employees. Bad working conditions restrict employees to show their capabilities, so it is important that the business realize the importance of good working environment. Kiva-questionnaire, Metal Age intervention, objective methods for improvement of ergonomic situation at workplaces and environmental measurements are useful to plan prevention and early rehabilitation before the disability appears.

The indoor air and other problems in the same workroom could be defined individually in quite different ways. Therefore, an individual approach for every workplace has to be implemented considering the anthropological and other features of the worker who will work in the certain workplace. The info-technology workers often work in under-lighted working conditions although there is a possibility to raise the (artificial) lighting to the normal limits (400–500 lx).

The main conclusion from the investigation is that stress situations at workplace could be prevented by use of proper intervention programmes (Metal Age).

In the modern era, the management of workforce has become more difficult because employees are highly qualified and aware of their rights while working in an organization. Good working environment increases employee loyalty, level of commitment, efficiency and effectiveness, productivity and reduces prohibit cost emerging as a result of dissatisfied employees. Such as, it is very wide category that incorporates the physical scenery (e.g. noise, equipment, heat), fundamentals of the job itself (e.g. workload, task, complexity), extensive business features (e.g. culture, history) and even extra business (e.g. industry setting, workers relation). However all the aspects of work environment are correspondingly significant or indeed appropriate when considered job satisfaction and also affects the welfare of employees satisfied with those who work under normal working condition and in return overall performance will increase.

REFERENCES

Babin, J.B. & Boles, J.S. 1996. The effects of perceived co-worker involvement and supervisor support on service provider role stress, performance and job satisfaction. *Journal of Retailing* **72**(1), 57–75.

Bakotic, D. & Babic, T.B. 2013. Relationship between working conditions and job satisfaction: the case of Croatian shipbuilding company. *International Journal of business and Social Science* **4**(2), 206–213.

Bojadijev, M., Petkovska, M.S., Misoska, A.T. & Stojanovska, J. 2015. Perceived work environment and job satisfaction among public administration employees. *The European Journal of Applied Economics* **12**(1), 10–18.

Borman, G.D. & Dowling, N.M. 2008. Teacher attrition and retention: A meta-analytic and narrative review of the research. *Review of Educational Research* **78**(3), 367–411.

Bozeman, T.D., Scogin, S. & Stuessy, C.L. 2013. Job Satisfaction of high school science teachers: prevalence and association with teacher retention. *Electronic Journal of Science Education* **17**, 1–19, ejse.southwestern.edu

Butt, G., Lance, A., Fielding, A., Gunter, H., Rayner, S. & Thomas, H. 2005. Teacher job satisfaction: lessons from the TSW pathfinder project. *School leadership and management* **25**(5), 455–471.

EPAM-5000 Environmental Particulate Air Monitor. http://environmentaldevices.com/hazdust-products/epam-5000. Accessed 20.04.2017.

EVS-EN-ISO 7726:2003. Thermal environments- Instruments and methods for measuring physical quantities. Estonian Standardization Board.

EVS-EN 15251:2007. Indoor environmental input parameters for design and assessment of energy performance of buildings addressing indoor air quality, thermal environment, lighting and acoustics. Estonian Standardization Board.

EVS-EN 12464-1:2011. Light and lighting- Lighting of workplaces- part 1: Indoor work places. Estonian Standardization Board.

EVS 891:2008. Measurement and evaluation of electrical lighting in working places. Estonian Standardization Board.

Clark, A.E. 1997. Job satisfaction and gender: Why are women happy at work? *Labour Economics* **4**(4), 341–372.

Colombini, T., Occhipinti, E. & Grieco, A. 2002. *Risk assessment and management of repetitive movements and exertions of upper limbs: job analysis.* OCRA risk indices, prevention strategies and design principles. Elsevier Science Ltd. London.

David, G., Woods, V., Li, G. & Buckle, P. 2008. The development of the quick exposure check (QEC) for assessing exposure to risk factors for work-related musculoskeletal disorders. *Applied Ergonomics* **39**, 57–69.

Gazioglu, S. & Tanselb, A. 2006. Job satisfaction in Britain: individual and job related factors. *Applied Economics* **38**(10), 1163–1171.

Gravele, M., Lakisa, S., Sprudza, D. & Vanadzins, I. 2013. *Carbond Dioxide Concentration in Indoor Air as a Characteristic of Ventilation System*. Thesis of Riga Stradins University Scientific Conference – Rīga, 2013, pp.172.

Hughes, G.D. 2012. Teacher retention: teacher characteristics, school characteristics, organizational characteristics, and teacher efficacy. *The Journal of Educational Research* **105**, 245–255.

ISO 16000-26:2012. Indoor air- Part 26 Sampling strategy for carbon dioxide (CO_2). ISO. International Organization for Standardization.

Jain, R. & Kaur, S. 2014. Impact of work environment on job satisfaction. *International Journal of Scientific and Research Publications* **1**(1), 8 pp.

Kearney, J.E. 2008. Factors affecting satisfaction and retention of African American and European American teachers in an urban school district. *Education and Urban Society* **40**, 613–627.

Kinzl, J.F., Knotzer, H., Traweger, C., Lederer, C., Heideger, T. & Benzer, A. 2005. Influence of working conditions on job satisfaction in anaesthetists. *British Journal of Anaesthesia* **94**, 211–215.

Labour Protection Requirements in Workplaces. 2010. Regulation No. 359, Cabinet of Ministers of Latvian Republic. Adopted 28 April 2009.

Lakisa, S., Gravele, M., Sprudza, D. & Vanadzins, I. 2013.*Microclimate Measurements of Office Work Environment*. Thesis of Riga Stradins University Scientific Conference – Rīga, 2013, pp. 171.

Locke, E.A. 1976. *The nature and causes of job satisfaction*. In Dunnette, M.D. Editor. Handbook of industrial/organizational psychology, McNally, Chicago, 1297–1346.

LVS EN 12464-1:2011. Light and lighting- Lighting of workplaces- Part 1: Indoor work places. The Latvian national standardization body LVS.

LVS EN ISO 7726:2004 L. Ergonomics of the thermal environment- Instruments for measuring physical quantities. The Latvian national standardization body LVS.

Maele, D.V. & Houtte, M.V. 2012. The role of teacher and faculty trust in forming teachers' job satisfaction: Do years of experience make a difference? *Teaching and Teacher Education* **28**, 879–889.

Martinsone, I., Lakisa, S., Sprudza, D., Vanadzins, I., Bake, M., Zellane, M. & Vizbule, L. 2013. *Work ability and Social Inclusion CB52. WASI Results- Latvia*. Riga Stradins Medical University. Institute of Occupational Safety and Environmental Health, 31 pp.

Mont, D. & Rees, D.I. 1996. The influence of classroom characteristics on high school science teacher turnover. *Economic Inquiry* **34**, 152–167.

Näsman, O. 2011. *Metal Age and Kiva-questionnaire*. Assist in navigation towards well-being at work. Mediona OyAb. The Archipelago Academy for well-being at work.

Ondrich, J., Pas, E. & Yinger, J. 2008. The determinants of teacher attrition in upstate New York. *Public Finance Review* **36**, 112–144.

Pille, V., Tuulik, V.-R., Saarik, S., Tint, P., Vare, T. & Sepper, R. 2015. Work-related musculoskeletal symptoms in industrial workers and the effect of balneotherapy. *Agronomy Research* **13**(3), 820–828.

Pille, V., Reinhold, K., Tint, P. & Hartšenko, J. 2016. Comparison of musculoskeletal disorders development in Estonian office and garment industry workers. *Agronomy Research* **14**(4), 1450–1466.

Raziq, A. & Maulabakhsh, R. 2015. Impact of Working Environment on Job Satisfaction. *Procedia Economics and Finance* **23**, 717–725.

Skalli, A., Theodossiou, I. & Vasileiou, E. 2008. Job as Lancaster Goods: facets of job satisfaction and overall job satisfaction. *The Journal of Socio-Economics* **37**(5), 1906–1920.

Sousa-Poza, A. & Sousa-Posa, A. 2000. Taking another look at the gender/job-satisfaction paradox. *International Review of Social Science* **53**(2), 135–152.

Spector, P. 1997. *Job satisfaction: application, assessment, causes and consequences*. Thousand Oaks, C.A., Inc. **(3)**, Sage Publications.

Sprudza, D., Kozlova, L., Lakisa, S. & Bake, M-A. 2014. *Evaluation of Work Ability and Stress of Office Workers*. Thesis of Riga Stradins University Scientific Conference - Rīga, 2014, pp.82.

Surakka, J., Kettunen, J., Piippo, J., Stenbock-Hult, B., Meigas, K., Tuulik, V. & Tint, P. etc., 2014. *Work Ability and Social Inclusion- WASI FINAL REPORT*. Arcada University of Applied Sciences, 67 pp. http://dspace.arcada.fi:8080/xmlui/bitstream/handle/10478/67/AWP_7-2014_WASI_Project.pdf?sequence = 1

Tella, A., Ayeni, C.O. & Popoola, S.O. 2007. Whole Work motivation, job satisfaction, and organisational commitment of library personnel in academic and research libraries in Oyo State, Nigeria. *Library Philosophy and Practice* (e-journal). Paper 118. http://digitalcommons.unl.edu/libphilprac/118 (April), 16 pp.

Tint, P., Traumann, A., Pille, V., Tuulik-Leisi, V.-R. & Tuulik, V. 2012. Computer users' health risks caused by the simultaneous influence of inadequate indoor climate and monotonous work. *Agronomy Research* **10**, 261–268.

Tuulik, V.-R., Tuulik, V., Pille, V., Tamm, M., Saarik, S., Vare, T. & Tint, P. 2013. Laser-Doppler perfusion monitoring, myotonometry, and work-place risk evaluation as assessment methods of musculoskeletal overuse syndromes in industry workers. *Journal of Rehabilitation Medicine* **45**, 976–977.

Vroom, V. 1964. Work and motivation. New York: Wiley, 331 p, Current Content, 27, July 8, 1985.

Weiss, H.M. 2002. Deconstructing job satisfaction: separating evaluation, beliefs and affective experiences. *Human Resource Management Review* **12**, 173–194.