

Latvian Ergonomic Society

**Ergonomics Research Centre
in the Faculty of Chemistry
University of Latvia**

*The 1st International
Scientific-Practical Conference of the
Latvian Ergonomics Society*

Contemporary Ergonomics and Business 2011

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PROGRAM & ABSTRACTS

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Latvian Ergonomic Society

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PREFACE

The ergonomics of the 21st Century is actuality in nowadays working environment, process management and relations. Ergonomics tightly associate success in business and employers wellbeing at organizations.

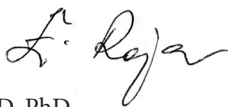
This year Latvian Ergonomics Society (LES) celebrates 5th anniversary. During past five years LES has unified more than 50 members of various professions, published many books, booklets and guidelines in ergonomics field that has stimulated ergonomics scientific and practical development in Latvia as well as understanding in society about ergonomics significance in human quality of life.

LES collaborates with Ergonomics Research Centre (ERC) in the Faculty of Chemistry, University of Latvia, providing consultations and participation in various projects in the field of ergonomics. LES and ERC carry out the scientific research and actively involve students of University of Latvia who attend a higher professional master study program «Work environment protection and expertise». In mentioned master study program the workplace ergonomics is included as a separate discipline. The research work also involves scientists and students from other Latvian universities (Riga Technical University, Latvia University of Agriculture, Riga Stradiņš University a.o.). LES established essential collaboration with International Ergonomics Association (IEA), Federation of the European Ergonomics Societies (FEES), Nordic Ergonomics Society (NES) and Pennsylvania State University (USA). The importance of this collaboration is a smooth and open dialogue between academia and industry enabling short decision paths and rapid access to reality based data, which can serve as a basis for new theories and applications.

At work and daily life diverse activities human was, remain, and will be the main value of the society despite country economics growth or crisis. Modern companies in Latvia create working conditions that are not only maintaining health and life but are also optimal for the needs and psychosocial capacities of workers. We are delighted that more and more organization managers tightly link business targets and economics indicators with workers wellbeing. Also employers more actively live healthy lifestyle and take part in development of healthy work environment.

The aim of the conference is to introduce with practical and scientifically granted ergonomics solutions in contemporary business environment, about healthy and safe work techniques, as well as promote international exchange of thoughts about human potential improvement at the organizations. Good cooperation between scientists in occupational health and ergonomics, employers and employees will guarantee improvements in health of work forces, as well as the development of business in a changing labor market!

Sincerely welcome to the ancient and eternally youthful Riga – Capital city of Latvia – at the golden autumn season!



Zenija Roja
As. professor, MD, PhD
President of Latvian Ergonomics Society



Valdis Kalkis
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CONTENTS

| | |
|--|----|
| Program | 8 |
| Klaus J. Zink | |
| THE RELEVANCE OF HUMAN FACTORS FOR MANAGEMENT AND SOCIETY | 11 |
| Valdis Kalkis, Zenija Roja, Henrijs Kalkis, Janis Svirksts | |
| THE CONCEPT OF ERGONOMICS STUDIES IN THE UNIVERSITY OF LATVIA | 12 |
| Oliver Scheffert | |
| CONTEMPORARY ERGONOMICS AND BUSINESS | 13 |
| Zenija Roja, Inara Roja, Inesa Remeza | |
| AUTOGENIC TRAINING BY MIND-BODY RELAXATION FOR EMPLOYEES WITH CHRONIC UPPER BACK PAIN IN TEXTILE ENTERPRISE | 14 |
| Merisalu Eda, Oha Kristel, Freimann Tiina, Sirk Tuuli | |
| WORK SPECIFIC FACTORS AND PREVALENCE OF MUSCULOSKELETAL DISORDERS AMONG OFFICE WORKERS, NURSES AND CAREGIVERS IN ESTONIA | 16 |
| Linda Rose | |
| ERGONOMICS AND ITS CONSEQUENCES FOR BUSINESSES | 17 |
| Iveta Palmsalu, Valdis Kalkis, Zenija Roja | |
| ERGONOMICS RISKS INFLUENCE ON TAILORS IN CLOTHING PRODUCTION COMPANY AND PREVENTIVE MEASURES | 18 |
| Janis Dundurs, Miervaldis Lacis | |
| OCCUPATIONAL NOISE EVALUATION | 19 |
| Henrijs Kalkis | |
| SUSTAINABLE BUSINESS DEVELOPMENT BASED ON QUALITY MANAGEMENT AND ERGONOMICS INTERVENTIONS | 20 |
| Liana Sare, Henrijs Kalkis | |
| MARKETING STRATEGY IMPLEMENTATION IN ENTERPRISE «TINTE» REGARDING TO ERGONOMIC PRINCIPLES | 21 |
| Gyula Szabo | |
| IDENTIFICATION OF SITTING POSITIONS WITH ARTIFICIAL NEURAL NETWORKS | 22 |
| Andris Zukovskis, Henrijs Kalkis | |
| ERGONOMICS RISK ASSESSMENT FOR HEALTHCARE STAFF | 23 |
| Atis Saulitis, Henrijs Kalkis | |
| ERGONOMICS ANALYSIS IN PACKAGING PROCESSES | 24 |
| Dagmara Sprudza, Linda Skreitule | |
| LIGHTING LEVEL ANALYSIS AT OFFICE WORKPLACES | 25 |
| Imants Bertaitis | |
| FACTORS FORMING SAFE WORKING ENVIRONMENT | 26 |

| | |
|--|----|
| Marija Avota, Andrejs Avots ERGONOMIC RISK FACTORS RELATED TO FEET PROBLEM OF MEDICAL PERSONNEL | 27 |
| Janis Gedrovics, Martins Puzuls, Zane Celmina ERGONOMIC CULTURE AS A COMPONENT OF WORK PROTECTION: IMPORTANT FACTOR FOR QUALITY OF LIFE | 29 |
| Nellija Dziedataja ANTHROPOMETRIC APPROACH IN DESIGNING OF OFFICE WORKING SPACE AND THE SIGNIFICANCE IN PREVENTION OF ERGONOMIC HAZARDS | 31 |
| Janis Gedrovics THE PLACE OF ERGONOMICS IN THE EDUCATION | 32 |
| Edina Gabor QUALITY CRITERIA OF WORKPLACE HEALTH PROMOTION PROGRAMMES | 33 |
| Valdis Vitols NEW LATVIAN ERGONOMIC KEYBOARD | 34 |
| Ieva Nartisa, Daina Silakalne PARTNERSHIP AS TOOL FOR INNOVATIVE BUSINESS ENVIRONMENT DEVELOPMENT IN LATVIA | 35 |
| Sandra Uselonoka, Zenija Roja POLYGRAPHY INDUSTRY COMPANY'S PERFORMANCE BY IMPLEMENTING ERGONOMIC IMPROVEMENTS IN WORKING PROCESS | 36 |
| Ilze Dejus, Henrijs Kalkis THE EFFICIENCY OF QUALITY MANAGEMENT SYSTEM IN ENTERPRISE LLC «LIEPAJAS UDENS» | 37 |
| Ansis Melko, Janis Ievins, Zenija Roja THE INFLUENCE OF WORKING ENVIRONMENT RISKS ON THE WORK ABILITY OF EMPLOYEES OF GRAIN HANDLING COMPANIES | 38 |
| Linke Knut THE TWITTER MILIEU – A REVIEW OF THE SOCIAL NETWORK SERVICE TWITTER WITH THE MILIEU THEORY FROM PIERRE BOURDIEU | 39 |
| Laine Knudsen Fogh USER FRIENDLY CONSUMER CROSS-BORDER COMPLAINT RESOLUTION IN THE EU: THE ADR INSTITUTIONS' PERSPECTIVE | 40 |
| Uldis Karlsons ANALYSIS OF PSYCHOLOGICAL RISKS FOR FARM MACHINERY DRIVERS IN CROP FARMING SECTOR | 41 |
| Inara Roja, Zenija Roja REHABILITATION TREATMENT FOR VICTIMS OF BULLYING IN THE WORKPLACE | 42 |

| | |
|---|----|
| Didzis Kursitis ASSESSMENT OF PHYSICAL LOAD AND PREVENTIVE MEASURES IN SAWMILL «MV TARA» LTD | 43 |
| Giuseppe Di Bucchianico DFA_FF (DESIGN FOR ALL FAST FORWARD): FROM A DESIGN «APPROACH» TO DESIGN «TOOL KITS» | 44 |
| Janis Stasa THE ERGONOMICS IN EDUCATIONAL INSTITUTION | 45 |
| Ligita Landzmane ORGANIZATION AND MANAGEMENT OF MEDIATION SYSTEM: MACRO- ERGONOMIC ASPECTS | 46 |
| Imants Ludvigs Mikelsons, Valdis Kalkis ERGONOMICS RISKS IN A MUSIC SCHOOL – PROBLEMS AND SOLUTIONS | 47 |
| Janis Rozenbergs STRATEGIC DECISIONS – NEW APPROACHES FOR SME’S IN LATVIA | 48 |
| Inese Davidsonsone THE ROLE OF ERGONOMICS IN SUSTAINABLE DEVELOPMENT OF LIFESTYLE BUSINESS | 50 |
| Janis Bartusauskis, Dzintra Atstaja, Janis Ievins, Anatolijs Jemeljanovs Environmental Risk Management | 51 |
| Maija Eglite SITUATION IN OCCUPATIONAL HEALTH IN LATVIA | 52 |
| Z. Martinsone, M.A. Bake, A. Seile, S. Lakisa, M. Zellane, P. Sudmalis, J. Svedovs INDOOR CLIMATE AND AIR QUALITY IN NON-INDUSTRIAL OCCUPATIONAL ENVIRONMENT | 53 |
| Norman Jablonski MOTIVATION IN THE AUSTRIAN BANKING SECTOR WITH REGARDS TO THE TWO FACTOR THEORY BY FREDERICK HERZBERG | 54 |

PROGRAM

7th October 2011

09.00–10.00 **Registration & morning coffee**
10.00–10.15 **Conference Opening and Welcome of participants**
10.15–12.45 **Key-note Speeches**
12.45–13.45 **Lunch**
13.45–14.30 **Poster Presentations**
14.30–15.00 **Coffee Break**
15.00–17.00 **Parallel Sessions**
17.00–18.00 **Closing the Conference and Discussions**

DETAILED PROGRAM

9.00 Registration & morning coffee
10.00–12.45 Key-note speeches

- 10.00 *Conference Opening and Welcome of participants*
📖 **Ilona Jursevska**, Minister of Welfare of the Republic of Latvia
- 10.15 *Ergonomics Development in Latvia*
📖 **Zenija Roja**, MD, PhD, As. professor, University of Latvia, President of Latvian Ergonomics Society (LES)
- 10.30 *The Relevance of Human Factors for Management and Society*
📖 **Klaus J. Zink**, Dr. PhD, professor, University of Kaiserslautern, Vice President and Treasurer of International Ergonomics Association (IEA), Germany
- 11.00 *FEES Contribution in Ergonomics Development*
📖 **Pieter Rookmaaker**, Eur.Erg, President of the Federation of European Ergonomics Societies (FEES), Netherlands
- 11.30 *Situation of Occupational Health in Latvia*
📖 **Maija Eglite**, MD, PhD, Professor, Rīga Stradiņš University, Institute of Occupational and Environmental Health
- 11.40 *Role of Physiotherapy in Workers Health Promotion*
📖 **Marika Briede, Dace Stirane**, Association of Latvian Physiotherapists
- 11.50 *Ergonomics and its Consequences for Businesses*
📖 **Linda Rose**, MSc, PhD, School of Technology and Health in Stockholm, senior lecturer in Ergonomics
- 12.20 *Health promotion with Doitex products*
📖 **Janis Supe**, SIA «Doitex»
- 12.30 *The role of Ergonomics in Latvian Business*
📖 **Eduards Filippovs**, Deputy Director General, Employers' Confederation of Latvia

12.45 Lunch

13.45–14.30 Poster presentations

Anthropometric Approach in Designing of Office Working Space and the Significance in Prevention of Ergonomic Hazards

▣ Nellija Dziedataja

Lighting Level Analysis at Office Workplaces

▣ Dagmara Sprudza, Linda Skreitule

Marketing Strategy Implementation in Enterprise «Tinte» Regarding to Ergonomic Principles

▣ Liana Sare, Henrijs Kalkis

Occupational Noise Evaluation

▣ Janis Dundurs, Miervaldis Lacis

Polygraphy Industry Company's Performance by Implementing Ergonomic Improvements in Working Process

▣ Sandra Uselonoka, Zenija Roja

The Influence of Working Environment Risks on the Work Ability of Employees of Grain Handling Companies

▣ Ansis Melko, Janis Ievins, Zenija Roja

The Significance of Early Multidisciplinary Rehabilitation in Health Promotion for Workers of Textile Enterprise

▣ Zenija Roja, Inesa Remeza, Henrijs Kalkis, Inara Roja, Valdis Kalkis

Work Specific Factors and Prevalence of Musculoskeletal Disorders Among Office Workers, Nurses and Caregivers in Estonia

▣ Eda Merisalu, Kristel Oha, Tiina, Freimann Sirk Tuuli

The Ergonomics in Educational Institution

▣ Janis Stasa

Assessment of Physical Load and Preventive Measures in Sawmill «MV TARA» Ltd.

▣ Didzis Kursitis

Analysis of Psychological Risks for Farm Machinery Drivers in Crop Farming Sector

▣ Uldis Karlsons

Ergonomics Risk Assessment for Healthcare Staff

▣ Andris Zukovskis, Henrijs Kalkis

Factors Forming Safe Working Environment

▣ Imants Bertaitis

Ergonomic Risk Factors Related to Feet Problem of Medical Personnel

▣ Marija Avota, Andrejs Avots

The Place of Ergonomics in the Education

▣ Janis Gedrovics

Ergonomic Culture as a Component of Work Protection: Important Factor for Quality of Life

▣ Janis Gedrovics, Martins Puzuls, Zane Celmina

Ergonomics Risks in a Music School – Problems and Solutions

▣ Imants Ludvigs Mikelsons

Identification of Sitting Positions with Artificial Neural Networks

▣ Gyula Szabo

Organization and Management of Mediation System: Macro-Ergonomic Aspects

▣ Ligita Landzmane

14.30 Coffee break

15.00–17.00 Parallel sessions

Room 1:

ROLE OF HUMAN FACTORS IN SUCCESSFUL BUSINESS DEVELOPMENT

Moderators: Maija Eglite,
Pieter Rookmaaker,
Guiseppe Di Bucchianico

15.00 *The Concept of Ergonomics Studies in the University of Latvia*

 **Valdis Kalkis, Zenija Roja,**
Henrijs Kalkis, Janis Svirksts


15.15 *Dfa_FF (Design for All Fast Forward): from a Design «Approach» to Design «Tool Kits»*

 **Guiseppe Di Bucchianico**

15.30 *Rehabilitation Treatment for Victims of Bullying in the Workplace*

 **Inara Roja, Zenija Roja**

15.45 *Ergonomics Risks Influence on Tailors in Clothing Production Company and Preventive Measures*

 **Iveta Palmsalu, Valdis Kalkis,**
Zenija Roja

16.00 *Environmental Risk Management*

 **Janis Bartusauskis**

16.15 *The role of ergonomics in sustainable development of Lifestyle Business*

 **Inese Davidsonsone**

16.30 *New Latvian Ergonomic Keyboard*

 **Valdis Vitolins**

16.45 *Indoor climate and air quality in non-industrial occupational environment*

 **Zanna Martinsone**

Room 2:

CONTEMPORARY ERGONOMICS IN CHANGING LABOUR MARKET

Moderators: Henrijs Kalkis,
Klaus J. Zink, Linda Rose

15.00 *Quality Criteria of Workplace Health Promotion Programmes*

 **Edina Gabor**

15.15 *Sustainable Business Development based on Quality Management and Ergonomics Interventions*

 **Henrijs Kalkis**

15.30 *The Efficiency of Quality Management System in Enterprise LLC «Liepajas Udens»*

 **Ilze Dejus, Henrijs Kalkis**

15.45 *Partnership as Tool for Innovative Business Environment Development in Latvia*

 **Ieva Nartisa, Daina Silakalne**

16.00 *THE TWITTER MILIEU – A Review of the Social Network Service Twitter with the Milieu Theory from Pierre Bourdieu*

 **Knut Linke**

16.15 *User Friendly Consumer Cross- border Complaint Resolution in the EU: The ADR Institutions' Perspective*

 **Knudsen Fogh Laine**

16.30 *Strategic Decisions – new Approaches for SME's in Latvia*

 **Janis Rozenbergs**

16.45 *Ergonomics Analysis in Packaging Processes*

 **Atis Saulitis, Henrijs Kalkis**

17.00 Closing the Conference & discussion

THE RELEVANCE OF HUMAN FACTORS FOR MANAGEMENT AND SOCIETY

Klaus J. Zink

University of Kaiserslautern, Germany

INTRODUCTION

There is no doubt that human factors or ergonomics has an image problem. It is often seen in terms of worker protecting laws – and these laws may be viewed as bearing costs while benefiting «only» employees. The intent of this paper is to show that this perception does not meet the truth at all. Therefore, the potential of human factors as an applied science has to be discussed and it has to be especially emphasized that ergonomics has always been associated with a positive economic mission – not just compliance with laws. This sometimes needs a macro-ergonomics approach.

METHODS

Examples which will be discussed focus on the relevance of new approaches for the health promotion that are included in a respective management approach.

RESULTS AND DISCUSSION

The increasing dynamic in changes – sometimes based on demands referring to globalization – needs ergonomics interventions to organize a change in a socially responsible way. Another effect of globalization can be seen in more and more international supply chains and working conditions in industrially developing countries. In some Western countries such as the USA or Germany developments created the necessity for more corporate social responsibility which has to include these international supply chains and working conditions in industrially developing countries. More and more companies are interested in these working conditions to keep their supply chain «clean». For several years we also see increasing work intensity in Europe and an increasing demand for flexibility which is creating a growing number of precarious jobs. As a consequence, there is a need to create sustainable working systems. This is of additional importance in Western countries with a shrinking work force. To be also competitive in the future, human factors can contribute to deal with the consequences of demographic changes.

Human factors, oriented activities in companies, respectively the absence of such activities, are much related to consequences affecting a whole society. Work-related injuries and the associated early retirements are only one example. But also «participatory ergonomics» as an element of a learning organization will lead to mature employees and mature citizens for society.

CONCLUSIONS

Human factors have the potential for a win-win situation for all relevant stakeholders of a company: owners, customers, employees, and society.

THE CONCEPT OF ERGONOMICS STUDIES IN THE UNIVERSITY OF LATVIA

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KEY WORDS: Ergonomics, Training Program, Assessment Methods

INTRODUCTION

It is known that in European Union (EU) countries a program concerning with the Harmonising European Training Programmes for the Ergonomics Profession (HETPEP) has been started. This program should cover education, skill building, mastering and experience stages. To reach this target requires increasing the speed of ergonomic training in Latvia too. Therefore, in the University of Latvia, thanks to support International Ergonomics Association, Federation of European Ergonomics Societies and Nordic Ergonomics Society, has been implemented ergonomics basic course in professional master's program Working Environment Protection and Expertise. Under this program it is possible to gain knowledge in contemporary ergonomics.

METHODS AND RESULTS

Today ergonomics in Latvia is on developing stage. Recent 15 years rapidly increases the number of employees suffering from physical workload. It is certain that employers and employees in Latvia lack the information about problems of health and safety at work in relation with physical load as well as ergonomics influence on organisation positive outcomes. Hence the ergonomics basic course has been implemented in the University of Latvia professional master's program Working Environment Protection and Expertise. This program educates and prepares competent specialists in the field of occupational health and safety, incl. ergonomics. Academic personnel in education process emphasize the importance of wellbeing (feel good, comfortably and safe) at the workplaces in connection with ergonomics interventions and organisation business results. The modern education methods are used in seminars (workshops, case studies, role games a.o.). Ergonomics course include such modulus: 1) Physical ergonomics; 2) Cognitive ergonomics; 3) Organizational ergonomics; 4) Ergonomic risk assessment methods, where especial attention are notice to objective (experimental) assessment of load: 1) Heart rate monitoring and measuring of metabolic energy; 2) myotonometric measurements using original device MYOTON-3 to assess the skeletal muscles fatigue and work ability.

CONCLUSIONS

Ergonomics study course is very essential in University of Latvia professional master's program Working Environment Protection and Expertise in order to develop successful business for various type of organizations based on contemporary ergonomics interventions.

CONTEMPORARY ERGONOMICS AND BUSINESS

Oliver Scheffert

University of Latvia

INTRODUCTION

The purpose of this research is to examine changing conception and use of ergonomics as it interacts with the relationship between the employee and the organization, as presented within scholarly and industry literature dating 1990 – present.

The Research Questions driving this inquiry are as follows:

1. What is the relationship between ergonomics and business productivity success, as reflected in scholarly and industry literature dated 1990 – present?
2. How has the conception of ergonomics and the theoretical framework surrounding it changed in the period 1990 – present, as reflected in scholarly and industry literature?
3. Finally, how do the changes identified in response to research question #2 relate to more generalized changes in the conception of the workplace and employee/ employer relationships?

METHODS

The methodology followed is an original thematic and textual analysis on existing literature dealing with the value of ergonomics in the workplace, particularly as it relates to morale and productivity and/or success of the business venture. The focus is not only the results of the existing studies, but also an analysis of their thematic framework and the ways in which ergonomics is viewed. Scholarly articles dating 1990 – present are selected and analyzed.

RESULTS AND DISCUSSION

Ergonomics measures to lead to improved business outcomes, and success is manifested in various degrees and types. The conception of the role of ergonomics does appear to have been changed in the period 1990- present, based on the articles surveyed. At the beginning of this period, ergonomics was viewed principally within the framework of risk prevention. Some authors expressed dissatisfaction with this framework. Subsequently, a new understanding of ergonomics as an integral component of the participatory workplace systems has emerged. It is hoped that the benefits of newer theoretical frameworks regarding ergonomics can subsequently be implemented and expanded upon for an ongoing improvement in the results.

AUTOGENIC TRAINING BY MIND-BODY RELAXATION FOR EMPLOYEES WITH CHRONIC UPPER BACK PAIN IN TEXTILE ENTERPRISE

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³Institute of Occupational Health and Safety, Riga Stradiņš University, Latvia

KEY WORDS: Packing Operators, Chronic Pain, Autogenic Training

INTRODUCTION

In Latvia employees with chronic upper back pain are males and females with sensitized nervous system, psychosomatic health problems and chronic pain patient's behaviour. Chronic neck-shoulder pain (NSP), lasting 4 months and any longer is significant problem for employees in textile enterprises. Frequently the pain is caused by psychosocial and individual risk factors in the workplace. It influences workers life quality in general. The aim of this study was to evaluate the effectiveness of using one month autogenic training (AT) for packing operators in textile enterprise who suffer from chronic pain in upper back region.

METHODS

Packing operators (n=29), with neck and shoulder pain (NSP) took part in our investigation during 2010-2011 years, mean duration of pain was $5.5 \pm SD 1.5$ months and mean duration of professional experience was $8.2 \pm SD 2.0$. The questionnaire was done to find out which body parts suffer from pain during work load, unhealthy postures at workplace and maladaptive thoughts. During testing for AT course with follow-up assessment at 3 and 6 months was selected 10 packing operators female employees. The intensity of NSP before and after each AT session was determined by using Numerical Rating Scale. Life quality assessment in females with chronic NSP was realized before and after each AT session by Quality of Life Scale. Confidence interval was calculated.

RESULTS AND DISCUSSION

It was found that 29 operators with chronic NSP have unpleasant physical and emotional experience caused by stressful, unhealthy postures at workplace a.o. 10 packing operators were under one month AT course evaluation (4 sessions, 60 minutes long one session). AT included suggestions for body-mind relaxation, analgesic suggestions, detecting depressive mind by positive self-influence. An individualized compact disc with AT suggestions for self-practices at home two times a day between sessions and after treatment course was made and given to each patient. The results indicated decrease in pain intensity for females from 5.54 at the beginning of AT course till 1.0 at the end of AT course. Follow-up assessment at 3 and 6 months after AT course indicated lasting reduction in pain intensity for females, which can be explained by benefits of positive self-influence during AT and mind-body relaxation practice at home by compact disc. After hypnotherapy course for all participants in our research (n=10) the life quality increased significantly.

CONCLUSIONS

Use of AT treatment by mind-body relaxation for packing operators, suffering from chronic neck-shoulder pain is an effective treatment in management of chronic pain patients with the psychosomatic complains.

WORK SPECIFIC FACTORS AND PREVALENCE OF MUSCULOSKELETAL DISORDERS AMONG OFFICE WORKERS, NURSES AND CAREGIVERS IN ESTONIA

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³ Tartu University Hospital, Tartu, Estonia

⁴ Põlva Hospital, Põlva, Estonia

INTRODUCTION

The aim of the study is to describe work specific factors and prevalence of musculo-skeletal disorders (MSD) among Estonian office workers, nurses and caregivers.

METHODS

A postal survey was carried out in 2008, in course of international study «Cultural and Psychosocial Influences on Disability» (CUPID). The randomly selected study group, nurses of Tartu University Hospital and Estonian University of Life Sciences and total sample of office workers of Tartu University and caregivers from Estonian hospitals and nursing centers, responded to the questions about MSD-s in past 12 months (low back, neck, shoulder, elbow, wrist/hand, knees).

RESULTS AND DISCUSSION

The response rate for whole study group was 56% (n=643): office workers 59% (n=220), nurses 57% (n=237), caregivers 52% (n=186). Participants were in average age 40?11,5 years, 95% of them were female and 76% worked 40 hrs per week. Differences between occupations of work specific factors were observed ($p<0,0001$). When to compare with office workers the nurses and caregivers had more tasks involving repeated movements of wrist or fingers, pending and straightening of elbow and working with hands above shoulders' height for longer than one hour in total. Caregivers have more weight lifting tasks (>25 kg), kneeling and squatting for a longer than one hour a day. The office workers have more autonomy in decisions over working tasks, time and style than nurses and caregivers. Over the 12 months prior to the survey 33% of respondents had at least one MSD lasted 1-6 days and 66% reported an MSD present for at least 7 days. MSD prevalence by regions differed by occupation. The highest low back pain reported caregivers (63%), then nurses (55%) and office workers (42%) ($p<0,0001$). The highest wrist/hand pain had office workers ($p<0,006$). Of the MSD-s 1321 reported by 643 respondents, only 139 (10,5%) took time off work and more often caregivers ($p<0,0001$). Low back pain correlated positively with lifting weights >25 kg and kneeling more than one hour in total ($r=0,20$ and $r=0,18$, $p<0,01$). Elbow pain was in positive relation with target number of tasks that are expected to finish in the day ($r=0,16$, $p<0,001$). Age, gender, ethnicity, working hours and experience didn't influence the prevalence of MSD-s.

CONCLUSIONS

Work specific tasks differ by the occupations, where nurses and caregivers report more repetitive movements with hands. Specific for caregivers' work is weight lifting and kneeling and office workers have better autonomy in working task.

ERGONOMICS AND ITS CONSEQUENCES FOR BUSINESSES

Linda Rose

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As ergonomists, for many of us, a driving force is to improve work environments to «do good»: to reduce risks for injury and human suffering, improve working conditions and support human well-being. This motivation is in accordance with the first of the two objectives of ergonomics as in the IEA definition – ‘...to optimize human well-being and overall system performance’. However, ‘doing good’ in this sense can be difficult. A challenging task we face as ergonomists is to motivate work site improvements within a business environment that is focused on the second objective of ergonomics, overall system performance. Thus, the art of ergonomics lies in balancing the two – in addressing individual wellbeing as well as the broader goals of system performance. As part of this balancing act, displaying financial impacts of ergonomics plays an important role and is therefore the focus of this key-note.

In all business activity decision makers have to choose between different investment options. For investments that can improve ergonomics, the full economic benefits are often difficult to quantify. Such benefits are associated with reduced costs related to non-optimal work environment. Visible costs, such as direct costs for absenteeism, are quite easily measured while hidden costs, related to business key parameters, such as productivity and quality issues, are often complex, contextually dependent and difficult to estimate. However, these issues are vital for organizations and such costs, which directly affect the company’s competitiveness, are often many times greater than the visible costs. If decision makers only are aware of the direct financial impact of investments they may prioritize solutions that are not optimal neither for organizational performance and business results nor for the work environment and health of the employees. In extreme cases this can jeopardize the company’s future.

So, what is needed for informed decision-making? First, awareness that ergonomics also influences core business parameters and organizational performance is needed. Second, there is a need for user-friendly assessment tools to estimate the financial effects associated with workplace ergonomics. Reasons why these tools aren’t more widely used are discussed. There is an increased call from companies for assessment tools that companies can use in their operational management to motivate and carry out ergonomic improvements.

There is also an increased awareness from company management, who recognize that improved working environments also lead to other positive effects for the company. Increasingly managers seek knowledge for informed decision making, for example when prioritizing between work environment improvements and strategic corporate decisions. The assessment tools can be used i) proactively in the design of production systems, which leads to advantages for the staff as well as for the company’s performance, ii) reactively to evaluate different scenarios to reduce work environment, productivity and quality problems and iii) strategically for promoting the company. So, what actions are needed to improve these assessment tools, increase their use of and make them a natural part in the company operational processes? In this presentation some research and development suggestions are given. These involve tool as well as organizational and process development. In summary, working towards improved tools and their usage in striving towards the twofold ergonomics objective involves many challenges, but strengthens the possibilities to be successful in «doing good», for individuals and organizations, as well as for societies.

ERGONOMICS RISKS INFLUENCE ON TAILORS IN CLOTHING PRODUCTION COMPANY AND PREVENTIVE MEASURES

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KEY WORDS: Tailors, Ergonomics, Risk, Assessment, Prevention

INTRODUCTION

In Latvia the textile industry has a great influence of ergonomics risks. Tailors frequently complain about the pain and discomfort in the neck and shoulder area. This pain is associated with monotone, consistent hand movements, which are constantly repeated, utilizing specific muscle groups. The aim of this research was: to evaluate ergonomic risk factors of tailor's and elaborate preventive measures. Research was done in sewing company LLC «PRIVA».

METHODS

Staff survey questionnaire about ergonomic risk factors; Load Key Indicator Method – Option C; Quick Exposure check (QEC) method.

RESULTS AND DISCUSSION

Survey results showed that the female tailors have overload in shoulders, arms, back. 76% of employees' exposure levels are high, and 14% is very high. 13% of total employees are subjected to high back overload. The neck, wrists and joints resulted in average load. 60% of the tailors admit that their job has to be done in limited time and therefore they are subjected to stress at work. Findings of the QEC method showed that tailors have load in shoulder / arm and neck area, as well as the working place and stress level assessed correspond to II degree of risk. This means that there are necessary mandatory health examinations and the company management needs to consider the rotation of the work forms in order to tailor's muscle groups can relieve. Results of the Load Key Indicator Method showed that the tailor's workload corresponds to III risk level, which is substantially increased. The elaborated preventive measures include seat and work surface adjustments to employees work comfort and abilities.

CONCLUSIONS

Authors conclude that in tailor's ergonomics risk assessment the most appropriate method is Load Key Indicator Method – Option C. There is a need of continuous improvement of workplaces in connection with ergonomics solutions in order to avoid health problems associated with the ergonomics risks.

OCCUPATIONAL NOISE EVALUATION

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INTRODUCTION

Irreversible hearing impairment is the common risk caused by occupational noise. The Regulations No 66 of 4 February, 2003 of the Cabinet of Ministers of Latvia «Occupational safety requirements regarding the exposure of workers to the risk arising from occupational noise» (Regulations) prescribe the requirements for the protection of employees from the risk caused by noise of the work environment. The indicators causing the risk are defined in these Regulations similarly as in the Directive 2003/10/EC of the European Parliament and of the Council. There in Regulations also are appointed the actions how to reduce the risk caused by noise and given the guidance of measurements as well. Unfortunately, the practice shows that measurement guidance given in Regulations is not very suitable for obtaining straight results and in some cases comes in conflict with the International standard methods.

METHODS

We undertook the goal to work out the principally new guidance of occupational noise indicator evaluation to replace the existing procedure in the Regulations. It has been used the International standards corroborated by the Technical Committee of Standardization «Acoustics, mechanical vibration and shock».

RESULTS AND DISCUSSION

The new guidance of occupational noise indicator measurement relates to the stationary, semi-stationary and mobile work places. In the stationary workplace the location of an employee is fixed, excluding the time-outs. In the semi-stationary workplace the location of an employee vary repeatedly day-by-day covering some definite number of workplaces. In the mobile workplace the location of an employee is varying in the room or territory during 8 hours of workday and cannot be characterized by very concrete place or location. The accredited laboratory is the only performer of measurements using the calibrated standard sound level meters. To avoid any misunderstanding and disaccord among the measurement operators we propose the common terminology. All exposure measurement process is divided in eight clearly distinguished goes. The new procedure states the locations of measurement microphone taking in account the worker's activities, timetable of tasks of a concrete person, exposures to noise, calculation of uncertainties and assessment of the work environment risks.

CONCLUSIONS

This new guidance of occupational noise indicators measurement and the evaluation has been elaborated for replacing the existing procedure in the Regulations No 66, 2003.

SUSTAINABLE BUSINESS DEVELOPMENT BASED ON QUALITY MANAGEMENT AND ERGONOMICS INTERVENTIONS

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Key Words: Business, Ergonomics, Quality Management, Organization

INTRODUCTION

Initially, quality management was used to enhance manufacturing processes through the quality circles and control application. But nowadays, quality aspires to achieve various types of organizations. Potential explanation is contemporary business evolution, dynamic response to the complex challenges, superior customer satisfaction and competition. Therefore modern managers have to seek for new ways how to achieve sustainable business development. Hence micro and macro ergonomics interventions in organization's strategy, business and quality management processes have great potential.

METHODS

Research aimed to study how quality management and ergonomics interventions can help to achieve sustainable business development based on theoretical analysis.

The monographic research method, graphical and comparison method were used to analyze theoretical data of ergonomics and quality management impact on organization business processes and hence prove the approach to sustainable business development.

RESULTS AND DISCUSSION

The tools and methods developed from statistical process control, quality circles to present widely applied total quality management (Russell, 1991). Since 1985 the International Ergonomics Association (IEA) initiated to develop an area in ergonomics that can be used by the business management (Lee, 2005). Ergonomics can be linked to organization business strategies in various scopes: business function strategies, cross-functional strategies and corporate strategies (Dul and Neumann, 2009). In this research author present the theoretical model of sustainable business development based on process quality management and ergonomics interventions. This model is in close relation to the classical *Deming* continuous improvement cycle and European quality organization guidelines.

CONCLUSIONS

The scientific disciplines of quality management and ergonomics are interconnected based on the theoretical analysis. The theoretical model of the sustainable business development can be based on the principles of continuous process quality management and ergonomics interventions, considering human factors, social-economic stability, management strategy, culture a.o. factors.

This work has been supported by the European Social Fund within the project «Support for Doctoral Studies at University of Latvia».

MARKETING STRATEGY IMPLEMENTATION IN ENTERPRISE «TINTE» REGARDING TO ERGONOMIC PRINCIPLES

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KEY WORDS: Ergonomics, Marketing, Strategy

INTRODUCTION

Nowadays, we face increasing competitive conditions in bar and nightclub market. To remain competitive and attract customers, mentioned businesses have to continuously improve and offer high quality and prompt service, competitive prices, and marketing programs for consumer needs and demand. The purpose of the report is based on marketing and ergonomics theories to analyze enterprise » Tinte» internal and external environment, the level of customers loyalty as well as create and implement marketing strategy plan according to ergonomics principles.

METHODS

In research were used the theoretical research methods, analysis of literature, documents, legislation, information obtained on the Internet and graphic analysis. There was also utilized quantitative research method – a questionnaire by which authors elaborated the satisfaction rate of internal and external bar customer's.

RESULTS AND DISCUSSION

The questionnaire results showed that service staff of enterprise «Tinte» are mainly satisfied with the organization of work, but 91% these workers, believes that improving the ergonomic principles of workplace, the service could improve to attract more customers in less time. Authors observed results and suggestions how to improve marketing strategy, especially focusing on ergonomics development hence promoting customers' satisfaction level and enterprise working efficiency.

CONCLUSIONS

Ergonomics is science of welfare and comfort, it has close relationship with marketing, because improving working environment, enterprise welfare and profit increase as well what is fundamental of marketing. In terms of such relationship internal enterprise's customer is satisfied and available to attract and persuade new loyal external customers. Hence implementation of the marketing strategy based on ergonomic principles enterprise will gain new loyal customers and will improve whole enterprise efficiency.

IDENTIFICATION OF SITTING POSITIONS WITH ARTIFICIAL NEURAL NETWORKS

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INTRODUCTION

The seating time of wheelchair users can exceed 18 hours, but the adverse effects of sitting position can be reduced with good sitting behaviour, ie. – regular position changes, dynamic sitting. The sitting of people with spinal injury should be static because of the loss of sensation that leads to persistently high local pressures creating the conditions for the development of pressure ulcers. To learn the good sitting behaviour, to operate a patient-handling or biofeedback device the duration and the quality of the actual sitting positions should be on-line instrumentally evaluated. It was published that the identifying of sitting positions possible with pressure mapping instrument applying cluster analysis. In this paper sitting positions are discriminated by the application of Artificial Neural Networks (ANN) to processing the data of a pressure mapping instrument.

METHODS

An mFlex 16*16 sensor pressure mapping mat device was used to record a total of 212 pressure distribution of one person in four seating positions (leaning left, leaning right, right foot on left knee, left foot on right knee). The measurement was recorded in the range of 0...200 mm Hg. IBM SPSS Statistics 19 was used to data analysis. Independent variables used in the assessment were the measurement values A1...P16, the target variables were the seating position.

RESULTS AND DISCUSSION

With the TWOSTEP CLUSTER analysis including all the independent variables four cluster was generated, referring exactly the four sitting position. With a Multilayer Perceptron Network including all the independent variables (PARTITION TRAINING=6 TESTING=3 HOLDOUT=1) the execution stopped, because of the high number of variables and diversity of values. However the ANN was created with four input variables randomly selected and/or the input variables was recorded into four categories (1...50 mm Hg, 51...100 mm Hg etc.). The ANN was also created successfully with 20% of the cases to train. With four input variables randomly selected and with recoded values (PARTITION TRAINING=3 TESTING=4 HOLDOUT=3), the Overall Correct Prediction rate of the sitting position was 94.1%.

CONCLUSIONS

The statistical analysis validated the previous research published. Both the cluster analysis and ANN modeling can identify different sitting postures. It was found that with a limited number of low resolution sensors, and with a few measurements sitting positions can be discriminated applying Artificial Neural Networks.

ERGONOMICS RISK ASSESSMENT FOR HEALTHCARE STAFF

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INTRODUCTION

In Latvia health care is one of the economic sectors in which workers suffer from work overload caused by health problems. This applies particularly to nurses and nursing assistants. Nurses and nursing assistant's work is based on the dynamic type, frequency, whole body movements, bending movements, lifting and moving patients. Physical overload is due to increased muscle, skeletal and connective tissue disorders and peripheral nervous system. Health care staff when lifting and moving patients lack the necessary lifting and handling equipment. Employers and employees have also insufficient knowledge of proper lifting and handling regulations. There is no ergonomic risk identification and assessment for each individual employee. The study included 8 nurses and 19 nursing assistants, including 22 female and 5 male. Aim of the work is to assess the ergonomic risks for employees lifting and moving mentally ill patients and to develop practical recommendations for prevention.

METHODS

The Key Item method, NIOSH Recommended lifting equation, and the Quick Exposure Check (QEC) method for load assessment of certain parts of the body.

RESULTS AND DISCUSSION

Using Key Item method the results show that nurses and nursing assistants are subjected too very hard work and risk levels for male (refer IV level of risk) and for female – risk level V. The recommended weight limits almost three times exceed the permissible limit (NIOSH equation). Using QEC method results, it shows that mainly were affected following body parts during the worktime: back, neck, arms / wrists. The preventive measures were done in order to reduce physical load for nurses and nursing assistants. Particular focus was given to purchasing mechanical equipment and training of employees.

CONCLUSIONS

In work with mentally ill patients nurses and nursing assistants are exposed to heavy physical work and therefore essentially is to precisely assess ergonomics risks for each individual employee.

ERGONOMICS ANALYSIS IN PACKAGING PROCESSES

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KEY WORDS: Ergonomics, Analysis, Packaging, Process

INTRODUCTION

There are many kinds of manufacturing processes which are mechanized and computerized in Latvia. But still in some processes, there is a need for manual physical load lifting and handling. Based on experience in the risk assessment procedures at the work places, authors state that monotonous load lifting is widely spread among packaging processes in various manufacturing companies. In the research the investigation of load lifting and moving were made in packaging process for different industries: wood processing, cellulose manufacturing, food processing, machinery and recycling.

METHODS

For the analysis of load risks the Key indicator method (KIM) and Method of Quick Exposure Check for quick identification and assessment of workload's influence was utilized. National Institute for Occupational Safety and Health (NIOSH) lifting equation was applied in assessment for lifting and lowering tasks.

RESULTS AND DISCUSSION

Workers lift and move greater load during the work if reduced arm movements and the distance of moving the load or other NIOSH multipliers values. Packaging operators in many cases elevate and displace the various objects as well as work includes compulsory work postures (III to IV risk degree by KIM). Those methods effectively allowed determining additional risk probability in respect of possible diseases and accidents in different parts of the body.

CONCLUSIONS

Ergonomics risk assessment methods used in the research were appropriate to analyze packaging processes in order to provide prognosis work-related musculoskeletal disorders. The necessary preventive activities to reduce the heavy workload in packaging can be achieved by improving work organization, work environment and technologies. Further, more detailed investigation of physical load is necessary in all investigated organizations.

LIGHTING LEVEL ANALYSIS AT OFFICE WORKPLACES

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INTRODUCTION

The light in human life has an important role because it affects the body's mental functions and psychological processes. Good lighting helps better distinguish between objects, create an exhilarating atmosphere, rising emotional tone, increase productivity and quality. Insufficient lighting in space, especially at work, causing the vision organ effort, suppress the body's physiological and psychological function, leads to fatigue and increases the likelihood of injury. The aim of the work is to analyze the lighting level values of the office workplaces, following Rīga Stradiņš University (RSU) Laboratory of Hygiene and Occupational Diseases database.

METHODS

The RSU Laboratory of Hygiene and Occupational Diseases was used for data analysis, database data over the period from 01.01.2007.until 24.05.2011. Measurements were made in artificial light with luxometer «Testo 545», (measuring ranges from 0 to 32.000 lx). They were selected for analysis of measurement results taken at the principal office, where the staff is working with paper and computer. For data analysis was used Microsoft Excel software.

RESULTS AND DISCUSSION

Overall, during five years studies made by Laboratory, light measurements were made, of which 1388 or 22 % were made directly in the premises, where people work with documents and computers. In surveyed period, light level measurements in 56% of workplaces in office premises is less than Latvian recommended reference value. Lighting in the range of 300-500 lx is considered sufficient for normal human visual perception, which provides the necessary visual acuity and no fatigue. Following recommendations of the Cabinet of Ministers (CM) No. 359 workplace lighting in the office must be at least 500 lx. Lighting 500 lx and more was 44% of measurements. Several office workers have complained of too much light or glare. It should be noted that the CM determines the rules of the office and other job lighting lower limit, but not the higher. Complaints over-bright lighting runs over 800 lx. In 11% cases of all analyzed measurements in the office were 800 lx and more. Only 33% of the measurements were following the regulation of CM recommendations.

CONCLUSIONS

1. Lighting levels by more than half of office desks (56%) is lower than the Cabinet of Ministers Regulation No. 359 recommended values.
2. Office employees have complaints about the glare effect.
3. Light level excess, ergonomic and glare effect in the workplace have not been adequately studied.

FACTORS FORMING SAFE WORKING ENVIRONMENT

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INTRODUCTION

The word *work* has been mentioned as the first noun in a frequency dictionary of the Latvian language. In some dialects in Latvian the word *live* has obtained a meaning *work*. Philosopher Hannah Arendt distinguishes between three levels of human activity. The highest level, which we would like to strive for, is *action*. A human is communicative, public, free and full of initiative there. Labour Protection Law gives the following explanation for the performance of internal supervision of the work environment, namely, it is planning, organization, implementation and management of undertaking business activities in order to ensure safe and harmless to health working environment. The explanation contains a term *safe and harmless to health work environment*. The aim of the research: to ascertain what a safe working environment is, what are its components, how the competence of employees, employers and labour protection specialists affect safe working environment, and to establish a model of a safe working environment by incorporating the above mentioned factors.

METHODS

Reflection of a personal experience and an analysis of literature sources.

RESULTS AND DISCUSSION

It is necessary to change the attitude of society towards labour and its protection. Currently, labour protection is focused on elimination of consequences rather than causes. One of them is lack of people's competence on labour protection issues. The preferred direction: *from labour protection to safe labour*, with appropriate environment. A safe working environment includes competences of three subjects:

1. Employer;
2. Employee;
3. Labour protection specialist.

Any competence is based on knowledge, skills and attitudes, as well as in the ability to learn and use these components in a responsible way. It is determined by the society's education in labour protection issues. Particularly important is learning to transform oneself and the society (UNESCO's strategy for Sustainable Education development 5th pillar) in order to build up a safe and harmless to health working environment.

CONCLUSIONS

1. In order to facilitate the transition from labour protection to a safe labour, it is necessary to change the attitude of the society towards labour and its protection.
2. The competence of employers, employees and labour protection specialists is particularly significant when forming a safe working environment. Their competence shall be based on knowledge and skills, and includes attitude and responsibility. It has to be developed according to the European Qualification Framework based on the UNESCO Education for Sustainable Strategy Development.

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ERGONOMIC RISK FACTORS RELATED TO FEET PROBLEM OF MEDICAL PERSONNEL

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INTRODUCTION

Medical personnel are subjected to numerous ergonomic risk factors while at work, and that can influence their health. Medical personnel perform most of their job on feet, lifting and moving weights. There is a continuous interaction between the environment and a person that is why it is necessary to take into account principles of ergonomics at a working place to minimize the effect of the risk factors on a person. To minimize the load on legs and spine, it is significant to manage correctly lifting and relocation of patients and to use appropriate footwear when being on feet for long time. To be able to eliminate possible risk factors, it is necessary to know preventive measures. There were medical personnel involved in the research to find out condition of their feet, awareness about the situation of their feet and possibilities of feet correction.

METHODS

The research involved medical personnel of a multi-profile clinic – nurses, doctors, nurse assistants – to find out the condition of their feet, awareness about the situation of their feet and possibilities of the feet problems correction. The number of respondents included in this research was 102. Standardized questionnaire was used as an instrument of the research. A computerized foot diagnostic system Pad Professional was used to assess objectively the condition of the feet. The data of the research work were processed with computer programs *SPSS for Windows* and *Excel*. Descriptive statistics are used.

RESULTS AND DISCUSSION

The data, that were obtained during the research, was indicative of feet problem spread among medical personnel – out of 102 respondents only 10 (4.2%) had no complaints, out of 78 respondents that were involved into podometric test, nobody was diagnosed to have a totally healthy foot. The podometric examination showed that 65 (83.3%), which is the vast majority of respondents, have transverse arch flattening. Explicit transverse arch flattening was diagnosed to 8 (10.3%) and longitudinal arch flattening to 5 (6.4%) respondents. Medical personnel is not informed well enough about the possibilities of the feet problems correction with the help of orthopedic customized insoles, but most of them 68 (54.0%) admit their significance in feet deformation correction and 66 (64.7%) name correctly the qualities of orthopedic customized insoles impact. Analyzing the awareness about the right height of the shoe heel, 68 (66.7%) mark the right version, though the respondents themselves at home 90 (87.6%) and especially at work 58 (56.8%), where great amount of load on feet is present, wear footwear with improper height of heel.

CONCLUSION

The data obtained in the research shows the actual situation of feet problems among medical personnel and prove the urgency of this topic. The awareness of medical personnel about their feet problems is insufficient, 94 (91,3%) respondents have never used any of the objective feet examination methods. There is also not enough attention paid to prevention of feet problems – footwear with wrong height of heel is being worn at home and at work, orthopedic footwear, orthopedic customized insoles are practically not used at work.

ERGONOMIC CULTURE AS A COMPONENT OF WORK PROTECTION: IMPORTANT FACTOR FOR QUALITY OF LIFE

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INTRODUCTION

The practical application of the ergonomics is the adjustment of the working environment for an employee. It is based on the principles of the ergonomics together with the principles and recommendations of other industries, incorporating requirements for the labour protection to encourage the maintaining the health of an employee in a long-term perspective, especially what regards different conditions of the working environment as the risk-factors for the health, thus reaching the improvement of the quality of life. The ergonomic culture is a substantial factor for the improvement of the quality of life, obeying the requirements and principles for the work protection precisely first of all.

METHODS

The questionnaire method and the observation were used for the research in 2009-2010 amongst the office workers and the call centres as well as students in several higher education institutions.

RESULTS AND DISCUSSION

The majority of the respondents mostly type text, send and receive e-mails and search for the information. 60% of the students, 79% of the office workers and 100% of the operators of call centres spend more than 4 hours in front of the computer every day, however only 45% of the operators of the call centres, 59% of the office workers and 0% of the students have been instructed in the work safety repeatedly, whereas about 10% of the total amount of the respondents are of an opinion that no repeating instruction in the work safety is necessary for them. The ergonomic working culture can be described also by the obeying the requirement for breaks during the work with the computer. Only 19% (this number is 27% amongst the operators of the call centres due to the existing schedules that include 15-minutes-long breaks after every 1-1,5 hours, and a longer break for about 30 minutes) of the total amount of the respondents confirm the obeying the requirement for a break during the work with a computer. A big part of the respondents, including, almost all students have mentioned the *working until the job is finished*, and more than half of the respondents have mentioned irregular breaks (*if it is possible*). Only a very small part of the respondents (not more than 4%) uses the breaks for exercises. Only about half of the total amount of the respondents admits that their workstation conforms the requirements of the ergonomic, where 23% (offices) to 32% (call centres) respondents admit not being aware of such requirements. This might mean that the instructions provided to the workers of the call centres are obviously formal, and the workers do not pay much attention to them.

CONCLUSIONS

The users of computer do not obey the requirements for the ergonomic work safety. The ergonomic culture are not developed enough at the work places analyzed in this research. This demonstrated the need for additonal efforts from the specialists for the work safety as well as finacial resources, both, for introducing with the relevant requirements and for controlling the obeying them. This includes obtaing different accesory parts for facilitating the work with the computer (palm pads, foot rests etc.).

ANTHROPOMETRIC APPROACH IN DESIGNING OF OFFICE WORKING SPACE AND THE SIGNIFICANCE IN PREVENTION OF ERGONOMIC HAZARDS

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INTRODUCTION

Anthropometry is the science of measurement and the art of application that establishes the physical geometry, mass properties and strength capabilities of the human body. Measurements of human are important for many applications, including designing of various kind of working spaces. Human body size and dimensions relates to the so-called ergonomic fit, or *ergofitting*, of the user and to the environment – it is aspect of man – machine interface to which the ergonomist constantly allude. The purpose of this research is to analyze the existing theory of anthropometry and to focus on anthropometric aspects of ergonomics and to investigate how anthropometric data influences the designing of the office space, furniture and fitting regarding the prevention of the ergonomic hazards.

METHODS

Reference method, logical constructive method, graphical analysis, monographic analysis methods were used in this research.

RESULTS AND DISCUSSION

Regarding the design of the office working space, the anthropometric approach is essential. In accordance with the theoretical analysis, designers, who create situation awareness and consider ergonomics requirements, need to generalize the design process into five major categories (concept, design, analytical prototype, structural prototype, operational prototype) by applying various methods. All methods make predictions about the user, the device/equipment or the user and device/equipment. Prototyping stage of design process is one of the key stages. Theoretical data show that we can identify three main forms of analytical prototyping for human interfaces: functional analysis; scenario analysis and the structural analysis. The last two are also related with anthropometric approach in designing of office working spaces. The most important is to understand by any designer who creates the new working environment, how to fit working space, furniture and equipment to particular user as there are no «average» individual users in the world.

CONCLUSIONS

Applying proper design means using dimensional criteria – anthropometric data – for developing design requirements. Prevention of ergonomic hazards includes the designing of office space and awareness of usual risks of the workers, not to admit possible improperly designed workstations, tools, and equipment. In order to match the potential users of planned design, there is a need to judge and the detailed comparisons of the individual measurements of persons described in published survey reports.

THE PLACE OF ERGONOMICS IN THE EDUCATION

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INTRODUCTION

The verities of the ergonomics from the industry come wider into other fields, such as office, household, leisure time etc. The education is not an exclusion, or to say more precisely – the institutions of the education from kindergarten to university. However, depending on the classical application of the ergonomics (the adjustment of the working environment for the worker; incl. student as worker) a new practical application and scientific research field appears in the education, the educational ergonomics or pedagogical ergonomics.

METHODS

On the one hand, the literature analysis method was used in the research, and on the other hand, the questionnaire method was used parallelly to the measuring fulfilled between 2000 and 2010 in several institutions of education in the groups of students as well as the teachers.

RESULTS AND DISCUSSION

Underlining that the problems of the working environment at schools are complex, because they include the factors of the ergonomics, the economics, the pedagogy and the social issues, a conclusion has been made that the students are not informed sufficiently on the impact of the working environment on their progress at school, nor the possibilities of maintaining their health and the terms. The teachers' impressions on these issues are also insufficient.

Students and unfortunately partly teachers do not consider computer as a significant factor of risk for their health. The most important component of the computerization of the schools is the implementation of the most modern technologies together with the safe work at the internet, almost completely ignoring the other health aspects related to the usage of the IT at schools.

It was found out that the widely used system of the rooms of the school subjects cannot provide everyone with a chair and desk adjusted for his or her anthropometrical sizes all day long. This and the fact that for at least 20-25% of the students the weight of their school bag exceeds the permitted weight put an additional load on their organisms. It was also observed that only each third student on average sits behind a desk with a suitable height all day long, but only each fifth student sits on a chair with a suitable height.

CONCLUSIONS

Basically, only the problems of the micro-ergonomics are observed and analyzed at the schools of Latvia, meaning those that affect each worker (student, teacher) in their contact with their work. The suitability of the school furniture, the weight of the school bags and the problems with the computerized workstations, on the one hand, and general instructing in the context of the professional health and the work safety, on the other hand, are the main problems in the context of the educational ergonomics in the schools of Latvia. The problems of the ergonomics, where a significant part is taken by the working environment (learning environment at school), are analyzed on a much smaller ground in Latvia.

QUALITY CRITERIA OF WORKPLACE HEALTH PROMOTION PROGRAMMES

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KEY WORDS: Quality Criteria, Workplace, Health Promotion, Programmes, Safety

INTRODUCTION

The aim of this paper is to summarize the main results of national and international literature on workplace health promotion and to review the best practices of workplace health promotion programmes.

METHODS

Literature's review.

RESULTS AND DISCUSSION

The programmes, summaries and recommendations of the WHO, ILO, CDC, NHS, EU, ENWHP, articles, and the experiences of national programmes are reviewed. The first part describes the national and international legislation and policy background of workplace health promotion and its borderlands (labour safety, occupational health).

The second part describes the special approaches of workplace health promotion and the quality criteria of the workplace health promotion programmes.

The third part contains the results of the European campaign of Move Europe. Under the leadership of ISPESL/University of Perugia, the European Network for Workplace Health Promotion (ENWHP) has developed this campaign for the improvement of lifestyle related workplace health promotion in Europe. A total of 26 member countries participated in the three-year campaign aimed at the dissemination of good practices in the field of lifestyle-oriented workplace health promotion. The Move Europe campaign in Hungary was coordinated by the National Institute for Health Development.

In the ending the recent activity of the European Network for Workplace Health Promotion is discussed.

CONCLUSIONS

The activity of the European Network for Workplace Health Promotion year-by-year produces an European-wide campaign that results several successful workplace health promotion programmes setting example for the enterprises.

NEW LATVIAN ERGONOMIC KEYBOARD

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INTRODUCTION

Increasingly more people use computers where content is created using keyboards (even with touch-screens). As in most of the world in Latvia conventional «Qwerty» keyboard is used which for Latvian is much worse than for English, especially due to enormous load to pinkie fingers. It causes repetitive strain injuries and affects productivity of workers with extensive keyboard usage, especially data input operators, call centers, inquiry office workers, etc. Improving computer keyboard layout – stress to hands and fingers is decreased thus exhaustion and injuries are minimized.

METHODS

With analysis of English and Latvian public domain novels and modern texts (more than 2 million characters), letter appearance an sequence distribution for Latvian was found. Qualities of alternative layouts for English (Dvorak, Colemak, Hallinstad) were investigated and open source «Carpalx» simulation tool was adjusted according to the findings.

RESULTS AND DISCUSSION

«Carpalx» was used to check more than 20 million keyboard layouts with the texts, measuring finger/hand effort, stroke typing convenience etc., to find the best one. It was proved that existing «Susildatec» (classic Latvian Ergonomic standard) keyboard is slightly better than «Qwerty» for Latvian though it is much worse for English. After computer simulation, several best layouts were tried practically for more than 6 months and most convenient one was promoted as a new «Latvia Modern» keyboard, which is much more convenient for Latvian: typing effort for fingers many time less, load distributed according to fingers' strength, and typing strokes are alternating better between hands and fingers. This layout is better for English comparing to «Qwerty» keyboard also. Keyboard drivers are developed for MS Windows and Linux operating systems and are freely available in the web. Investigations in computer-human interaction with speech-to-text tools is going, though they are not reliable enough for everyday use, and don't seem feasible for busy call center or other open-space office.

CONCLUSIONS

Keyboards will be used long time further and it is not too late to implement new standard layout for computer keyboards in Latvia similarly to Russian «JCUKEN» layout. Although the most improvement the new layout could provide for intensive typists, increasingly more people have personal computers and they are free to use this layout on computers they own.

PARTNERSHIP AS TOOL FOR INNOVATIVE BUSINESS ENVIRONMENT DEVELOPMENT IN LATVIA

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INTRODUCTION

Development of Latvian business environment is necessary, as situation in Latvia right now is not positive but has some potential. By Eurostat data, gross domestic product per capita in purchasing power standards in Latvia stands for only 52% of European Union's average. Global competitiveness index ranks Latvia in 70th place out of 139 countries (Schwab, 2010). By Eurostat data, in September 2010 in Latvia unemployment rate stated 18,3% compared to European Union's average of 9,6% in same period. It is understandable, as only 17% of all enterprises are innovative and we have only 337 large enterprises (Central Statistical Bureau, 2009)- there are neither for growth sufficient amount of large enterprises nor innovative enterprises in Latvia. Also amount of obtained patents is unsatisfactory: only 6 European Patent Office patents per 1 million people compared to European Union average, 120 patents. Latvian share in high technologies exports are only 3,2% while European Union average rate is 18,4%. The purpose of study is to find a tool for improving this situation in Latvia.

METHODS

Study was performed by analyzing data, researching best practice examples, interviewing experts and exploring latest tendencies and recommendations in literature and scientific journals.

RESULTS AND DISCUSSION

Unfortunately, both material and human resources by Latvian companies for the development of innovative activities have been insufficient. Therefore, there is a need of highly qualified academic staff's involvement in new product development and their cooperation with the enterprises becomes a decisive prerequisite for the development of innovative economic development.

CONCLUSIONS

Partnerships are insufficiently used tool for creating innovative business environment and has to be promoted between both entrepreneurs and researchers. In their work, authors offer several practical recommendations how this should be done and how to overcome the main reasons for lack of cooperation.

POLYGRAPHY INDUSTRY COMPANY'S PERFORMANCE BY IMPLEMENTING ERGONOMIC IMPROVEMENTS IN WORKING PROCESS

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KEY WORDS: Polygraphy, Efficiency, Ergonomics, Prevention, Organization

INTRODUCTION

Polygraphy is inextricably linked to the new technology and growing market demand. In Latvia this sector has proved its export performance and development. New technology not only increases the quality of production, but also improves the working conditions and environment bjectives.

The aim of the study was to explore the ways to improve the efficiency of employee in the polygraphy, in connection with the ergonomic solutions at workplace, based on the theory analysis.

METHODS

The study used a constructive logic, analysis and monographic method.

RESULTS AND DISCUSSION

Despite the development of technologies in the polygraphy industry, employees daily face with a variety of physical and ergonomic risks, such as increased noise, too bright or inadequate lighting, increased electrostatic field, forced postures, lifting of heavy items. These risk factors can significantly affect the health and the safety, causing accidents and occupational diseases, which in turn have a negative impact on labor productivity in general, because of increasing disability. Many authors emphasize the importance of preventive work, reducing the accidents and occupational disease risk, and increase the employee satisfaction, enhance the work efficiency, reduce employees' short-term cases and related absenteeism. It is essential that they are trained, as new technologies are often complex and time commitment to learning. Consequently, if there is the optimal and healthy working conditions then the employee will work more productively. Their work will not interfere with the harmful environmental conditions that may interfere with their duties.

CONCLUSIONS

The company which is introducing ergonomic improvements to work processes, can earn extra profits and motivate employees to better performance. The most important capital of the company's people and to ensure its performance and productivity is to invest funds.

THE EFFICIENCY OF QUALITY MANAGEMENT SYSTEM IN ENTERPRISE LLC «LIEPAJAS UDENS»

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KEY WORDS: Quality, Management, System, Efficiency, Improvement

INTRODUCTION

Nowadays in a changing economic environment and competitive conditions every enterprise has to find new ways to achieve the highest results with the least possible resources. One of the corner-stone to achieve this goal is quality management system – a tool which enables us to manage the processes of enterprise, to arrange a number of areas in the same time, to optimize processes and continuously improve them. Thereby in every enterprise where quality management system (QMS) has been introduced, a question arises: «How to ensure the efficiency of QMS in enterprise?». Therefore the purpose of the study is to investigate the efficiency of QMS in enterprise LLC «Liepajas udens» and work out suggestions for improvement of process quality management, based on theoretical analyses.

METHODS

The efficiency of QMS in enterprise has been analysed by survey of employees, which contains 40 different assertions in 7 different groups of them. Thereby the opinion about QMS of employees working in enterprise has been collected as well as the main problems of QMS process realisation and improvements have been identified. Defined problems have been analysed more carefully, thereby it was possible to identify also the level of leadership in which appropriate problem is the most essential.

RESULTS AND DISCUSSION

The QMS in enterprise LLC «Liepajas udens» is effective and ensures continuous introduction of processes. That is proved with the results of survey of employees, where 74% of employees manage and understand QMS, also they are interested in and motivated to continuously improve it. Though, the results of survey of employees show also several problems of QMS: employees have a lack of information and knowledge about enterprise, its function and processes of QMS, also about their work and role in the enterprise and its development.

CONCLUSIONS

Based on that conclusions have been made and the suggestions for improvement of QMS working in LLC «Liepajas udens» have been worked out.

THE INFLUENCE OF WORKING ENVIRONMENT RISKS ON THE WORK ABILITY OF EMPLOYEES OF GRAIN HANDLING COMPANIES

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KEY WORDS: a Dust, a Grain Reloading, a Risk Index, a Risk Grade

INTRODUCTION

According to EU statistics, Latvia is ranked fifth in the European Union in terms of grain export. Increase in the amount and intensity of work intensifies health problems for those working in national economy companies. Lately the number of occupational diseases in Latvia has rapidly increased. Joint stock company «Rīgas ostas elevatori» was chosen for the research. The goal of the research was to analyze working environment risks and evaluate their effect upon the work ability of the employees.

METHODS

The joint stock company «Rīgas ostas elevatori» was chosen for the research. An enquiry was carried out among 76 employees in order to identify the risks. The objects of study included physical workload, grain dust concentration in the air; the work ability index was established. The air pollution index (API) establishing method for workplaces was used to analyze the air pollution. Finland's 5-point method was used for the general risk assessment (Kalkis V., 2008.). Finland's 5-point method was combined with several modified matrixes for assessing different kinds of risks, such as API, noise, lighting, interior climate and workload. The method of research was developed and the working environment risk index was calculated.

RESULTS AND DISCUSSION

The data of the research show that employees who are over 50 years of age have been working for the company for more than 25 years and are exposed to high and low temperatures when working outside in the rain, snow, wind or draught, as well as to grain dust and physical workload. It is established that the dust concentration exceeds the latitude measurements for the profession and is heightened at the studied working places. The API at the company is variable and varies from grade II to grade IV. The employee is working in an unhealthy working environment and the general risk index equals grade III for seven hours of work at the grain silo department; at 11 hours the index equals grade IV. The work ability has been assessed as moderate.

CONCLUSIONS

The performers of the aforementioned type of work fall within a potential risk group because of the working environment; the results of the research using API and Finland's 5-point method prove this. However, despite the unfavorable working conditions, the work ability of the employees is moderate or good, depending on the age group. The working environment risk index has been calculated.

THE TWITTER MILIEU – A REVIEW OF THE SOCIAL NETWORK SERVICE TWITTER WITH THE MILIEU THEORY FROM PIERRE BOURDIEU

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INTRODUCTION

This article on the whole contains the results of the research in the online community Twitter for the German market. The research was oriented on the milieu theory of the French social scientist Pierre Bourdieu and was done with the approach to display more information about the users in the network to provide the ability to understand which user group mostly used this network and to provide a valid market segmentation tool for the online market. With information about available user group, companies are able to see if their customer group is in the network and on which features of a technical product the users focuses. Out of this, marketing activities and social media approaches can be developed and introduced more efficient onto the network.

METHODS

To test this approach Twitter was selected a fast pacing network with a so far not researched user group, based on market definition for the user. As methods for the research a quantitative approach was used based on the original research by Pierre Bourdieu. The questionnaire he used for his research and which is modernized used from other marketing companies in Europe to define milieus in the society, was used during this research to display that his items are also valid in the Internet and that his approach can be used also online. The questionnaire was processed through interviews with 20 persons during a web conference in Berlin which is the highly rates conference for the Internet users in Germany. The participants were randomly selected on the floor during the three days of the conference.

RESULTS AND DISCUSSION

As outcome of the questionnaire a high correlation between the most of the participants could be displayed. Only a few did not answer in that way as the most answers. Based on the aggregation information from the two German companies which defines milieus in Germany and the definitions by Pierre Bourdieu the outcome of the research amount of participants would be that mostly hedonism and experimental milieus are the users of the social network Twitter.

CONCLUSIONS

With the outcome of the research it can be estimated that the milieu theory is still valid, also in the Internet and can be used for this for social media and online marketing approaches. The research itself shows that the research design must transfer the questions in the questionnaire more into the modern world by introducing more items which are requested which are specially used for a dedicated milieu.

USER FRIENDLY CONSUMER CROSS-BORDER COMPLAINT RESOLUTION IN THE EU: THE ADR INSTITUTIONS` PERSPECTIVE

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INTRODUCTION

The author's previous articles have highlighted the unused potential of cross-border online shopping and sales. For consumers it is a possibility to find the best quality for the lowest price wherever a product or service could be located without leaving their homes and for the traders it is a possibility to survive and develop their sales in a time of recession thereby allowing both parties to benefit from the European Union (EU) Internal Market. The articles included important obstacles which withhold consumers and traders from selling and shopping cross-border online as well as revealed that consumers and traders have a grounded reason to feel fret whenever shopping and selling cross-border. The research revealed as well that although the European Commission (EC) has established different means to ensure a high level of consumer protection all over the EU and is considering and promoting as one of the effective consumer cross-border complaint solution methods alternative dispute resolution (ADR) schemes, the author's several year work experience in the consumer protection field have shown that ADR schemes are not functioning effectively and in the reality a consumer has to participate in effortful and time consuming case handling procedures with no guarantee of an amicable settlement. The main conclusions were that ADR work has to be improved and several possibilities were proposed to improve and develop ADRs which are dealing with consumer cross-border complaints. The aim of this article is to cover the author's latest research results which has examined the issue – how could consumer cross-border complaint resolution in ADR institutions be improved from the perspective of ADRs themselves?

METHODS

In the research mostly quantitative data collection and analysis methods as well as document analysis are used as a qualitative research method.

RESULTS AND DISCUSSION

The main results of the research include different efficiency preconditions which ADRs consider as important when solving consumer cross-border complaints.

CONCLUSIONS

Several possibilities were discovered how consumer cross-border complaint resolution in ADRs could be improved thereby becoming more user friendly not only for ADRs but as well for consumers.

ANALYSIS OF PSYCHOLOGICAL RISKS FOR FARM MACHINERY DRIVERS IN CROP FARMING SECTOR

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INTRODUCTION

The author of the research paper studies the key reasons causing accidents and impact of deliberate weariness and psychological condition on the health of farm machinery drivers and their ability to perform their duties in compliance with the labour protection laws and regulations. The aim of the research:

- to study psychological labour environment risk factors for farm machinery drivers working in crop farming sector and to work out proposals for minimising impact of psychological risk factors. The goals of the research:
- to choose a psychological risk identification method and to identify psychological labour environment risk factors as well as to evaluate their impact;
- having evaluated results of the research, to work out recommendations for minimising impact of psychological risk factors for farm machinery drivers working in crop farming.

Scientific literature and laws, and regulations of the Republic of Latvia regarding harmful factors of labour environment have been analyzed in the research Ppper, paying special attention to psychological labour environment risk factors and their impact on capacity of work and health of the employed.

METHODS

Methods applied in the research paper: theoretical analysis of literature, questionnaire. Information available on the web pages of national labour protection organisations and other Internet resources have also been used in the research paper.

RESULTS AND DISCUSSION

Strain.Phase is not observable 78.13% of the respondents, the phase is at the stage of formation of 12.50% of the respondents, the phase is completed 9.37% of the respondents. Resistance.Phase is not observable 65.63% of the respondents, the phase is at the stage of formation of 18.75% of the respondents, the phase is completed 15.62% of the respondents. Exhaustion.Phase is not observable 62.50% of the respondents, the phase is at the stage of formation of 25.00% of the respondents, the phase is completed 12.50% of the respondents.

CONCLUSIONS

Methods for the identification of psychological labour environment risks have not been specified in the laws and regulations of the Republic of Latvia. The impact of psychological labour environment risk factors on the health of farm machinery drivers working in crop farming sector is insignificant, these factors are by far the dominant ones in labour environment.

REHABILITATION TREATMENT FOR VICTIMS OF BULLYING IN THE WORKPLACE

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KEY WORDS: Workplace Bullying, Post-Traumatic Stress Disorder, Cognitive Hypnotherapy, Team Learning

INTRODUCTION

Work intensification in Latvia is common with other European countries and is connected with stressful working environment and workplace bullying. Employee-victim in such workplace suffers from post-traumatic stress disorder (PTSD). Rehabilitation treatment program for such victims includes short-term psychotherapy – cognitively oriented hypnotherapeutic treatment (CHT) with self-management strategies and team learning (TL) with improvement of workplace relations and organizational culture. The aim of this study is to approve rehabilitation treatment course – CHT and TL in working female victims of bullying in workplace, who suffered from PTSD.

METHODS

During year 2010 – 19 female patients, upper white-collar employees, in the age between 29 and 41 with PTSD after 6-12 months long bullying in workplace were consulted and underwent four weeks CHT and TL course. The Social Adaptation Self-evolution Scale (SASS) was applied to examine the evolution of patient's social motivation and behavior. The Post-traumatic Stress Diagnostic Scale (PDS) was used for females as self-administered test. CHT was used for females twice a week, TL – once a week, 60 minutes long one session. Our own practice standards were verified throughout three months after treatment course by re-reporting about life quality from 12 females.

RESULTS AND DISCUSSION

For fifteen females bullying was psychological aggression: social isolation, verbal aggression, spreading rumors, for four females – physical aggression: sexual harassment. Analysis of the results according to SASS and PDS showed significant health improvement at the conclusion of the therapy course for 17 females (84%), with level of significance: $p < 0.05$. 10 females during treatment course already did not tend to cope with their problems alone, they demanded their legal rights, consulted trade union representatives and achieved extermination of aggression at the workplace. Twelve females in follow-up reported about increased stress tolerance, growth of self-esteem and communicative competence.

CONCLUSIONS

Four weeks cognitive hypnotherapy course and team learning for female victims of psychological and physical aggression at workplace is an effective rehabilitation treatment with improving quality of life in bullying victims.

ASSESSMENT OF PHYSICAL LOAD AND PREVENTIVE MEASURES IN SAWMILL «MV TARA» LTD

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KEY WORDS: Ergonomics, Assessment, Physical, Load, Prevention

INTRODUCTION

Wood processing is one of the largest Latvian industries, but from the safety point of view wood processing is also one of the most dangerous industries, which has a high number of risks and accidents. In the research the assessment of physical load lifting and moving was made in manufacturing process in a wood processing company «MV Tara» Ltd.

METHODS

Author used the Key indicator method (KIM) and Method of Quick Exposure Check for identification and assessment of the wood processing operator's workload. The research was supplemented with National Institute for Occupational Safety and Health (NIOSH) lifting equation for the assessment and preventive measures in lifting and lowering tasks. Objective risk assessment method – heart rate monitoring – was used for metabolic energy evaluation and work heaviness degree determination.

RESULTS AND DISCUSSION

The results showed that risk level depends on the package height (for example, in the beginning of the packaging – the worker must place products at 20 cm or 80 cm in height above the floor level) risk degree by KIM and QEC may vary from IV to III for all investigated types of work. The practical recommendations for reducing heavy workload were carried out, taking into account the NIOSH lifting equation results. Heart rate monitoring for metabolic energy assessment showed objective results that sawmill workers are exposed to II work heaviness risk degree, which can be explained by good physical fitness of employees.

CONCLUSIONS

Objective results of physical load assessment using the Heart rate monitoring showed that sawmill woodworking operators are exposed to lower risk degrees (II) if compared to subjective risk assessment methods (KIM, QEC) where assessment of physical load correspond to III and IV risk degree. That proves the significance of objective risk assessment methods in wood processing enterprises. In order to reduce the physical workload in «MV Tara» Ltd there should be such preventive activities: staff rotating, experience exchange for utilizing the machine tools, stretching and relaxation exercises during the short and long breaks, mechanical lifting devices should be introduced in packaging processes, especially in the beginning of packaging.

DFA_FF (DESIGN FOR ALL FAST FORWARD): FROM A DESIGN «APPROACH» TO DESIGN «TOOL KITS»

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INTRODUCTION

The complexity of contemporary society is also expressed through the diversity among individuals. Diversity is expressed not only in terms of psycho-physical features, but also in relation to the social and cultural ones. The «Design for All», which is the «design of human diversity, social inclusion and equality», has always been compared with these issues. It proposes a holistic and innovative approach to the project, which considers the differences between individuals as an important resource for economic and social development, rather than as a «problem» or a «limitation» for the project.

The Design for All, therefore, extends the design target to «all» the possible users of a service, product or environment, in order to analyze with awareness their needs and aspirations. This expansion, however, while enables to prefigure new possibilities for innovation, on the other hand, puts some problems for the designer referred to the «management» of the extensive system of needs resulting from it.

METHODS

The paper proposes a reflection on the need for the DfA seeking methods and tools useful in changing from a theoretical «approach to an operational «practice» referred to the project.

Some operational tools are presented, developed at the Faculty of Architecture, University «G. D'Annunzio» of Chieti-Pescara (Italy), as part of a Master Degree Laboratory in «Design for All». These are tools that aim to facilitate the designer in the conscious evaluation of the complex system of requirements arising from the use of a multi-project «for All».

RESULTS AND DISCUSSION

In particular, the paper describes the «Ability/Difficulty Table», a tool useful for finding the so-called «limit users», and the «EWS/EWG Matrices», that represents a system of tools used primarily to identify the best design strategies related to environmental signage systems.

These are tools with an «information» value rather than a «determinative» one with respect to the detection of the limit users, to the description of their characteristics and needs, and to the identification of the most appropriate design strategies.

CONCLUSIONS

The paper ends with a brief description of some case studies in which the described tools were applied, thus emphasizing their utility to promote the development of a really inclusive approach to design.

THE ERGONOMICS IN EDUCATIONAL INSTITUTION

Janis Stasa

KEY WORDS: Education, Ergonomics, Designing

INTRODUCTION

The working environment, where a person of any age gets education, plays the main role in creating person's opinions. Since good organization and comfortable ergonomics in the educational institution a person gets the first and continuous skills and understanding of the role of ergonomics and the meaning of it in achieving good working results. Theoretically till age of 22 – 23 a youngster one-third of time spends in an educational institution. In Latvia the conception of «educational institution» is defined very widely, that is why it is purposeful to analyze how ergonomically proper the environment in these educational institutions is. The aim of the work is to draw society attention to ergonomics problems in the educational institutions.

METHODS

The logical-constructing method, authors theoretical and practical experience were used to build the analysis of the ergonomics essence in the educational institution.

RESULTS AND DISCUSSION

As the major problems, which influence the school work, is the ergonomics of the school block, the ergonomics of the working place (furniture), the organization of ergonomics (space layout, the number of persons in audience, the plan of studies etc.). Only partially the furniture in lecture-halls meets the anthropometry parameters of the audience and the layout in lecture-halls does not ensure comfort for the field of view of the audience. Very important for the right layout of lecture-halls is finances, but not less important is a wish and an attitude to arrange the working environment which meets ergonomic standards. The most common result of the project implementation is aesthetical gain, less ergonomic one. The results of author's work in separate lecture-halls in LLU reveal, only in part of the lecture-halls it is possible to apply modern technologies. The ergonomic aspects in the lecture-halls are resolved chaotically (incompletely) and only for a part of the audience and lecturers in it. The results of medical inspection of the new students show that students have serious deviations from the norm of good health. Worrying is the fact that most widespread are spinal problems and they have dynamical trend to grow. It is possible that the main cause is inappropriate furniture in lecture-halls and a bad ergonomic environment in it, also a low motivation of the students after work in lecture-halls, do some physical activities or sports.

CONCLUSIONS

In conclusion, there is no united standard of ergonomic issues in Latvia, which could be applied to any of the educational institutions. The problems of schools and youngsters have not been analyzed sufficiently, usually people try not to talk about them, and therefore the audience has small interest and only rough opinion on the working environment in educational system. The teachers have not studied the ergonomic issues that is why they have different opinions and explanations about it. The course of Ergonomics is a big rarity in the study programs of universities.

ORGANIZATION AND MANAGEMENT OF MEDIATION SYSTEM: MACRO-ERGONOMIC ASPECTS

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KEY WORDS: Mediation, Macro-Ergonomics, Non-Conflictogenic Management and Decision Making, System, Manager

INTRODUCTION

Aim of the study is following: on the basis of verities from scientific literature and empirical experience from expertise, to discover the problems from drawing up the mediation services quality that are unexplored in ergonomics scientific studies, and offer their solutions.

METHODS

The study was carried out in holistic context of systematic approach. The following instruments were used in the study and its description:

1. review of scientific studies, selection of the necessary theory analyses and positions;
2. meta-analysis of published studies related to the professional competence of Latvians;
3. interview results of five Latvian experts relevant to the study topic, chosen by the author;
4. synthesis of recommendations suitable for overcoming macro-ergonomic problems related to determining mediation quality based in theory of non-conflictogenic management and decision making.

RESULTS AND DISCUSSION

The goal of macro-ergonomics is a completely efficient work system at both the macro- and micro-ergonomic level which results in improved productivity, and employee satisfaction, health, safety, and commitment. It analyzes the whole system, finds how each element should be placed in the system, and considers all aspects for a fully efficient system. Management and decision making competence of the organizational system managers is the main intellectual tool that provides the system ergonomic working ability. Unskilled mediation system managers make poor decisions and reach erroneous conclusions, but their incompetence denies them the metacognitive ability to recognize their mistakes.

CONCLUSIONS

By taking into account a body of basic non-conflictogenic management and decision making principles, it would be possible to ensure qualitative or ergonomic mediation services, which combines different organizational mediation service subsystems and are understood and accepted by the society.

ERGONOMICS RISKS IN A MUSIC SCHOOL – PROBLEMS AND SOLUTIONS

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KEY WORDS: Ergonomics, Teachers, Musicians, Load, Work ability

INTRODUCTION

Playing musical instruments is a complex psychological and physical activity associated with many scientific fields. Without music sciences, as a psychology of playing music instruments and others, should be named physiology of the movement and neurology. Musicians with the work process are constantly exposed to ergonomics risk factors such repetitive hand and arm movements, painful and tiring postures.

There are a few methodical and general educational materials in Latvia on risk factors that would serve just emerging musicians and their teachers, the future musicians' mentors and musicians as a profession. There is not a study of ergonomic risk analysis for the use of music industry institutions in Latvia. Risks can not be eliminated entirely, especially if they apply to the music profession, so it is to learn to live with the minimum loss of health. The study aims are: to evaluate the music school jobs ergonomic risks and determine the workability on music secondary school teachers, musicians of various specialties, pianist accompanists.

METHODS

Such methods were used in the research: Load Key Indicator Method, Option C, Quick Exposure Control (QEC) method (with questionnaires for workers), determination of working ability index (WAI).

RESULTS AND DISCUSSION

Accordingly to the results of Load Key Indicator Method (Option C), the percussion musicians' physical workload corresponding level of risks II. Conductors and pianists, cellists and violinists, guitarists physical work load corresponding to the degree of risk 1st. With QEC method the estimated staff of secondary music school 68.3% are low risk exposure level, 25.9% a medium risk exposure level, 4.5% in high-risk exposure level and in 3 cases (1.3%) are very high risk exposure levels. At very high exposure levels are possible manifestations of occupational pathology – spinal disorders, joint strain, etc., which can occur in younger and older workers, even after a short working period.

A study carried out by identifying and analyzing the work ability index (WAI) for three teams of musical secondary school: musicians, technicians and teachers. Results showed that the average work ability index at music secondary school is 42.7 points that comply with good level.

CONCLUSIONS

The physical workload for musicians corresponds to appropriate load. In general during the work shift the musician has overload in arms and back. Work abilities conform to good level.

STRATEGIC DECISIONS – NEW APPROACHES FOR SME'S IN LATVIA

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KEYWORDS: Strategic Management, Decision Making, SME

INTRODUCTION

The financial crisis, which globalized economy has been facing for more than two years, put the stress on financial performance and criteria, but it may be time as well for a renewal in management, paying more attention to decisions that construct the future: strategic decisions. More and more voices call for a new way of thinking about strategy as a social construct to develop collective strategic intelligence in firms (Jarzabkowski, et al 2007). This social perspective on strategy needs to better understand the way individuals interact in the strategy process and actually do strategy.

Researchers (Mintzberg, Ahlstrand, Lampel 1998) have classified strategic management theories into ten schools, which are grouping in three directions. The first three schools (design, planning, positioning) are prescriptive in nature – more concerned with how strategies should be formulated than with how they necessarily do form. Design and planning schools have developed during the sixties and seventies in the 20th century. The positioning school was very popular during the eighties and one of the most famous scholars was Michael Porter. Representatives of positioning school considered that there are limited amount of successful strategies to manage the company, therefore very significant is precise analyze of external environment. Positioning school has developed a number of well known theories and methods: generic strategies, Boston matrix, experience curve, General Electric matrix, Porter's 5 Ps, Porter's value chain, etc. The next direction covers 6 schools (entrepreneurial, cognitive, learning, power, cultural, environmental), which emphasize the role of different aspects to formulate the strategy. The common value is to support idea that strategy formulation is never ending process, taking into account changes of environment. The third direction represents configuration school, which very often calls as a «roof school». This school combines methods and techniques from all previous mentioned theories.

Research on the strategic management is limited in Latvia. From the existing investigations it is possible to conclude that managers do not use techniques of strategic management to manage the company. The last tendencies demonstrate the willingness of businesses to consider strategic management as a tool for managing a company.

The aim of the paper is to compare and describe appropriate theories for strategic decision making in Latvian SME's after last global economic slowdown.

METHODS

The authors employ well-established quantitative and qualitative methods of research: grouping, analysis, statistic method, etc. The theoretical and methodological background of the research is formed by scientific researches and publications, publications from mass media and professional literature; statistical information from legal institutions as

well as information collected by the authors during the survey. The survey will cover 43 Latvian micro and small scale (<25 employees, <10 million euro) companies from different industries, which are in business more than 2 years.

RESULTS AND DISCUSSION

The research result shows that during the economic development it was not obligatory to plan a business – in many industries the competition was low. During the economic slowdown, situation has changed vice versa. Managers are looking for export markets, becoming a player of global competition.

In this research authors will present strategic decision making processes in Latvian SME`s considering the theories of the strategic management.

CONCLUSIONS

The last economic slowdown awakes interest in the strategic management. Up to now managers have done things intuitively taking into account the previous experience as well. Right now entrepreneurs turn more attention to evaluate external and internal environment, to set goals for a company and to find best strategies to compete in a market as good as possible. Also ICT technologies take very significant role in the business to market, sell or inform customers. Statistics show that in Latvia 96% are micro or small companies, for whom usage of traditional strategic management theories could be embarrassing. It could be a new challenge to develop strategic management practices for Latvian companies, considering local obstacles of business, social and political environment.

THE ROLE OF ERGONOMICS IN SUSTAINABLE DEVELOPMENT OF LIFESTYLE BUSINESS

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KEY WORDS: Ergonomics, Lifestyle Business, Sustainable Development, Happiness, Welfare

INTRODUCTION

The purpose of the article is to evaluate the role of ergonomics of the latest business philosophy – sustainable development of lifestyle business. What is the lifestyle business? In what extent this form of entrepreneurship promotes the happiness? How is it possible to improve the welfare of lifestyle business entrepreneur and to promote the sustainability with the help of ergonomics? What is aspiration for the entrepreneurs? What is the ultimate aim – money, welfare, development, growth, sustainability, stability or happiness? Is money the precondition for a happy life? Ergonomics is closely related to welfare and sustainability.

METHODS

Different opinion qualitative methods will be used.

RESULTS AND DISCUSSION

The researches define that the lifestyle business can be a foundation of the prosperous life. Not always the economical growth provides a happier life to individuals. Welfare is not perceived equally in modern society. Ergonomics helps in promoting the welfare. Happiness as such is the possible aim. The road to welfare has to be sustainable. The ergonomics science studies the person's relationship with work and implies that there is a connection with satisfaction, welfare, happiness and sustainability. The development of technologies and increasing economical efficiency has to be linked with the environment analyses and sustainable development principles. Lifestyle business in its philosophical matter is directed to sustainability and development and not to concentrating the capital. In certain countries lifestyle business is a standard therefore entrepreneurs who concentrate primary on gaining wealth are not perceived as normal.

CONCLUSIONS

The foundation of a happy life – to understand the essence of matters, nature flow and its connection with humans, to accept the place in life and not to desire unreachable things. The responsibility of the state is welfare politics. The originality of the article comes from defining the philosophy of lifestyle business. Defining the sustainable development. Analyses of ergonomics link to human welfare and comprehension of happiness. The essence of a happy, sustainable and welfare life – lifestyle business. In order to promote welfare in entrepreneurship it is also important to have a good will. The good will is the highest quality and condition for any other good things. The good will opposite to happiness is on its own, without our mightiness and power. In Latvia ergonomics in high extent is based on a good will. Society does not have enough strong perception of its role and nature and it is not possible to see its benefits and losses.

ENVIRONMENTAL RISK MANAGEMENT

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KEYWORDS: Environment, Risk Management, Emergency Situations

INTRODUCTION

For over than ten years the human civilisation has already been living in the XXI century. Humankind entered the new millennium equipped with an enormous lot of tools and devices it had created and which can have a profound impact on the surrounding environment and prove as powerful as our planet's own natural forces. Today, this is not only the fact to be proud of but the circumstance that causes serious concerns about our future. These concerns look reasonable since the cost humankind pays for such a power is coming as an increased number of explosions, fires and other sorts of emergency situations resulting in pollution of the environment and leading to adverse the social and the economic consequences.

Thus, the problems related to ensuring ecologically secure human existence in all surrounding environments are of primary importance in the new millennium as well. Today, experts in various fields began to study these problems since they are of a pronounced complicated intersectoral nature. That required a scientifically based approach to integrate of various scientific skills.

METHODS

If we look at an entity as a biosociotechnical system (BSTS), it might be said that such a system contains four risk varieties. These are a natural, a technogenic, a human factor and social risks.

Modern system of concepts about acceptable risk levels does not provide full description of all risks thus creating the situation where many essential risks fall beyond the scope of risk level monitoring and management system, which prevents the development of effective and efficient set of measures for the risk mitigation.

RESULTS AND DISCUSSION

Today, the most crucially important sphere of activity is the one dedicated to creation of the system of the parameters that would allow develop such perception of acceptable risk that would stay closest to the real circumstances.

CONCLUSIONS

Accident development scenarios become increasingly sophisticated. Procedural framework for assessing operation of the dangerous objects is still at the development stage, and, as analysis shows, quite frequently the task is being solved with the help of various methods in order to develop reliable scenarios and estimate the accident consequences. Therefore, to ensure development of the entity security programmes and protocols it is necessary to continue research, to develop economic concept for risk analysis. Within the framework of this concept risk analysis should be regarded as one of the components of cost/benefit study. Risk is an expected loss of usefulness caused by certain incidents or action. The ultimate goal is to distribute resources in the way that would allow for their maximum usefulness for the society.

SITUATION IN OCCUPATIONAL HEALTH IN LATVIA

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KEYWORDS: work risk factors, occupational morbidity, structure of occupational diseases

INTRODUCTION

Work environment in Latvia has changed rapidly over last 15 – 20 years due to global changes and changes in occupational and safety system. Work becomes more intense and requires maximum attention and concentration, adaption of work with mental and physical capacity of an individual. The aim of presentation is to analyse situation in occupational health and safety in Latvia during 15 years period. The study included analyse of objective measurements database of occupational risk factors in more than 7 000 enterprises and companies performed in period 1995 2010 by the Laboratory of Hygiene and Occupational diseases of the Institute of Occupational Safety and Environmental Health of Rīga Stradiņš University. The analysis of registered occupational diseases according to the data from the State Registry of Occupational diseases run by Centre of Occupational and Radiation Medicine of Pauls Stradins Clinical University Hospital for the same period was performed. Occupational diseases in Latvia are diagnosed and coded in accordance to the International Classification of Diseases.

RESULTS

Results of measurements showed that occupational risk factors occur in all economic sectors and can affect large number of employees. For one third of measured occupational risk factors values exceeded recommended limits. The traditional work risk factors (chemical, physical, biological) have been partly changed by new risks (ergonomic and psychosocial factors). Results of study indicated that the following enterprises form a risk group of non-compliance with legislation regarding occupational health and safety: small enterprises; enterprises of private and non-governmental sectors; enterprises of different industries (construction, metal processing and wood processing). The number of firstly diagnosed occupational diseases and patients has gradually increased. The total number of firstly diagnosed and registered occupational patients per 100 000 employees was 11.2 in 1995 and 140.5 – in 2009. Structure of occupational diseases shows musculoskeletal diseases (46.1%) as leading group of diseases followed by diseases of nervous system and organs of sense (29.3%), traumatic disorders and intoxications (11.7%). Increase of registered occupational diseases is related to growing awareness of employees, increasing number of occupational physicians, as well as possibility to receive monetary compensation.

CONCLUSIONS

Early diagnosis of occupational diseases during compulsory medical examinations is essential. This will reduce necessity for compensations from the Special Budget for workplace accidents to be paid in case of permanent loss of work ability. To facilitate returning of employees into labour market after occupational illnesses, the focus should be switched to effective rehabilitation. The study indicates that there is a need to improve occupational health and safety legislation, as well as system for explaining such legal requirements and building public awareness.

INDOOR CLIMATE AND AIR QUALITY IN NON-INDUSTRIAL OCCUPATIONAL ENVIRONMENT

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INTRODUCTION

The indoor climate and air quality in non-industrial workplaces (mostly offices), are very serious problem, because there are lack of ventilations and standards for good indoor air quality (includes, temperature, humidity, air flow, particles, volatile organic compounds (VOC), ozone, carbon dioxide etc.) in Latvia.

The purpose of the study was to detect the main indoor air quality (IAQ) problems in non-industrial workplaces – in offices.

METHODS

The all measurements were tested during full working day (8 hours) in winter and spring period. During study 14 offices' premises of 10 offices were assessed, mostly, open type offices). The indoor climate was characterising by physical parameters (air temperature, humidity and air flow) and therefore, also for carbon dioxide, was used multifunctional equipment TESTO 400. The air quality was tested by different instrumentation, it depends on the aim of measures: VOC's and aldehydes were tested by Gas chromatography (Varian 3800) and High-Performance Liquid Chromatography (Waters Alliance 2695); non-organic gases (NO_2 , SO_2) also O_3 were tested by photo spectrometry (Varian Cary 50); particles were tested by count (P-Track Ultrafine Particle Counter) and surface area concentration (AeroTrack9000).

RESULTS

The indoor climate was identified as non-acceptable in most of cases: too high air temperature (above $+24\text{ }^{\circ}\text{C}$), too low air humidity ($<30\%$) and no air flow at all or only 0.01 m/s . The concentrations of VOC's were detected as acceptable in most of cases, if analysed each compound separately, but, if analysed summary concentration of all VOC's, it a little bit increase acceptable limit (0.3 mg/m^3)! Aldehydes also exceeds acceptable limit (0.1 mg/m^3) in most of cases. The non-organic gases were evaluated as acceptable, but CO_2 concentrations almost all cases (mostly in afternoon) exceed acceptable limit – 1000 ppm . The ozone exceeded acceptable limits in cases of high load copying. The concentrations of particle count were in range: $1880.0 - 14756.0\text{ particles/cm}^3$, but surface area in range: $1.5 - 55.5\text{ }\mu\text{m/cm}^3$.

CONCLUSIONS

The indoor climate of non-industrial workplaces is poor and employees have not influence to control indoor climate. The levels of chemical pollution depend on: site location, organization of ventilation systems, printing/copying load, cleaning of carpets, equipment and furniture in the non-industrial workplaces. There is necessary to apply IAQ standards from Europe and USA in Latvia.

MOTIVATION IN THE AUSTRIAN BANKING SECTOR WITH REGARDS TO THE TWO FACTOR THEORY BY FREDERICK HERZBERG

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INTRODUCTION

Are there any differences in the motivation of younger employees in comparison to the motivation of older employees? Can these differences be explained according to the various motivators of Frederick Herzberg's Two Factor Theory?

The focus of this paper is on the motivational behavior of younger and older employees in the banking sector. In contrast to other publications on this topic segment, this study forbears from researching motivational backgrounds in general but rather concentrates on the attitudes of bank employees with respect to their age. A primary study was conducted to recognize a tendency or trend in the attitudes of employees in the Austrian banking sector, with the objective to determine certain causality with reference to motivational theories that are described and discussed in this thesis. Special emphasis is placed on motivational differences of employees who are under 29 years and employees over 40 who are assumed to be less motivated than their younger colleagues with Frederick Herzberg's «Two Factor Theory» serving as the theoretical background. In connection with this theory, it is to be found out whether it is still valid 50 years after its development. Due to the vastness of the topic as well as for the answering the research question of this paper, an extensive literary research is carried out including standard literature and the latest findings in the field of motivation as well as an empirical study.

METHODS

On the basis of the research question, the following structure of the thesis can be outlined:

- (1) The most important technical terms are defined and discussed in the (extended) introduction.
- (2) The first main part of the paper is dedicated to the existing motivation theories and to the critical discussion of Frederick Herzberg's Two Factor Theory.
- (3) The Austrian banking sector is analyzed and discussed in an economic context in the second main part.
- (4) In the third part of the paper the results of the primary study in Austria are presented and discussed.
- (5) The fourth and last part refers to the expected development (as a consequence of the employees' attitudes survey).

With the results gained from the empirical study it should be possible to give banks an insight in the future development of the sector as well as a better basis for their decisions in human resources.

RESULTS AND DISCUSSION

According to the objective of this thesis the findings of the employees' survey can be summarized as follows:

In literature further education is often understood in different ways, as gaining an in-depth knowledge of certain topics and updating already existing knowledge in a certain area or as a means of change and orientation. Thus, further education can be seen as a training parallel to work and as educational means to be able to change work-wise.¹ As for the banking sector both kinds of further education are applicable. Banks clearly focus on further education and welcome it. However, the survey's results show that further education is not adequately communicated to employees over 40 and that trainings are not adjusted to their specific requirements either.

In the author's opinion employees over 40 would like to talk about further education with their superiors and to gain new perspectives while superiors might not see a reason to do so due to the experience of employees over 40. However, the findings show that those employees are interested in further education and thus would like to talk about their options with their superiors. This wish should be acknowledged by the management.

Human resources development is a central aspect in banks and employees are likely to avail themselves of possibilities for development. Especially the aspects of advancement and recognition are positively evaluated by younger employees while employees over 40 would like an improvement in these areas.

«Superiors should not be satisfied with the mere statement 'I am (dis)satisfied' but should find out more about the reasons for (dis)satisfaction.»²

A possible instrument for human resources development would be the introduction of quality circles which give employees the possibility to voluntarily discuss problems or weaknesses in their departments and to develop possible solutions which then could be implemented by human resources.³

Especially the answers to question 29 on the transparency and traceability of career possibilities in the bank showed that employees over 40 find it hard to comprehend human resources decisions. Thus it should be found out how they could be motivated in terms of advancement possibilities. What is of importance is that career plans are developed individually and that individual wishes are taken into account of course in accordance with human resources possibilities in the bank. Career planning can be part of appraisal interviews or it can be discussed with the superiors in special meetings dedicated to developing a career plan. It is crucial that employees over 40 have the same possibilities to talk about their career plan as their younger colleagues since they have the same need to talk about their career and to get feedback on their work.

Another possibility would be focusing on a career plan. The findings show that employees who have a career plan in the bank are supported by their superiors to accomplish it. Such a measure would also contribute to the transparency and traceability of human resources decisions.

CONCLUSIONS

The findings of the survey suggest various possibilities for improvement as regards the current work situation in the Austrian banking sector. In general the motivators of both younger and employees over 40 are quite similar and their motivation is good. However,

¹ Becker (2002) p. 151.

² Nerdinger (2003) p. 12.

³ Hentze (2001) p. 339.

there is the potential for improvement. Improvements could be achieved by measures on the part of human resources or the management. Sometimes it would only require minor changes to significantly improve the work situations for younger and older employees.

Even though this paper did not explicitly refer to the complex issue of globalization, it can still be pointed out that motivation is likewise crucial in international enterprises. In this context, it might be interesting to find out if older employees with a long experience in the banking sector compare the current situation to former times and only see the drawbacks of globalization or if they perceive this global phenomenon as a chance of which they avail themselves.

Major differences in the motivators according to Frederick Herzberg could not be compared as was discussed in the beginning of the thesis. Motivators do change satisfaction but their absence does not necessarily lead to dissatisfaction which is clearly reflected by the findings of the study. It was also confirmed in the findings that growth and complacency are at the center as was stated by Herzberg.

Due to the comparisons of the attitudes of younger and older employees it can be ascertained that Herzberg's theory is still valid in the 21st century.