The aim of this research is to demonstrate the situation in teacher job satisfaction in the state and to study correlations between the job satisfaction of teachers and quality of education, thereby showing the importance of teachers’ emotional feelings in the process of assuring quality education. The research data were collected at 5 schools with high achievements of the pupils in the mandatory centralised national examinations and at 6 schools with low results demonstrated by the pupils. As a result of the research, it was concluded that teachers are mostly satisfied with the chosen profession. An analysis of the identified correlations between job satisfaction and quality of education showed that there is significant correlation between several levels of interpersonal relationships and various aspects of quality. The obtained results the significance of the pedagogical resource in provision of education as well as allows to identify the scales of teacher job satisfaction with lower ratings which should be improved to significantly improve the overall satisfaction of teachers with their job.

Key words: job satisfaction, quality of education, teachers job satisfaction.

Introduction

The professional activity of the teacher plays a very significant role in assuring quality education, and one of the factors influencing the professional activity of the teacher is job satisfaction.

According to literature analysis the dominating factors which influence teachers’ satisfaction with their job have been formulated: they include internal factors related to the mutual relations between the teacher and the student, teacher’s calling for being a pedagogue.

A conclusion drawn from the research results is that the situation of teacher’s job satisfaction is rather positive because most of the job satisfaction scales are above medium. The most highly evaluated job satisfaction scales are satisfaction with the level of responsibility, satisfaction with colleagues and satisfaction with the specifics of the job.

At the same time, the lowest evaluated scale is satisfaction with the salary and the second lowest scale is satisfaction with being secure about the future at work.

An analysis of the correlations between teacher job satisfaction and quality of education lead to conclusions that there are higher numbers of and statistically more significant correlations in the evaluations provided by the teachers from the schools with higher achievements of the pupils.

An analysis of the identified correlations between job satisfaction and quality of education showed that there is significant correlation between several levels of interpersonal relationships and various aspects of quality.

The purpose of the research is to identify the current level of job satisfaction among teachers and to discover correlations between teacher job satisfaction and quality of education.
In psychology, it has been for quite a long time that discussions are on-going about the role of the employee’s job satisfaction in their efficiency at work (Vroom, 1964). Besides, studies conducted so far have demonstrated (Petty, McGee & Cavender, 1984) close correlations between job satisfaction of the employee and their performance at work. There is an assumption that employee job satisfaction not only closely relates to their efficiency at work, but also has direct impacts on their efficiency at work (Furnham, 2005). Theoretically, this leads to a conclusion that teacher job satisfaction is closely related with their professional activity and, thereby, also with quality of education.

In definitions provided by several authors, job satisfaction is understood to be a varying emotional state (Chapman, 1994; Spector, 1997) caused by the working conditions (Locke, 1976). Job satisfaction is a subjective assessment created by the individual’s specific feelings and the coherences between the anticipated and the actual (Arnold, Feldman & Hunt, 1992).

Job satisfaction may be influenced by very different factors, which are related with the job directly and indirectly. Job satisfaction is influenced even by such personal aspects as age, health, job experience, emotional stability, social status, leisure time activities, family as well as other factors (Schultz & Schultz, 2006).

Speaking about factors that influence job satisfaction, there are internal and external factors. More specifically, the following factors are identified when discussing factors which have impacts on job satisfaction of teachers:

- Internal factors – these factors are determined by the peculiarities of the class. The interrelations between pupils and teachers, the individual peculiarities and perceptions of pupils (Sharma & Jyoti, 2006). Teachers’ internal satisfaction with their job may occur from classroom activities (Perie & Baker, 1997).
- External factors – there are various factors which determine teachers’ satisfaction with their profession, such as salary, cooperation, and administrative support, security in the school, and availability of school resources. (Sharma & Jyoti, 2006)

There are very few teachers who work in this profession for the external factors. Most of teachers opt for this profession specifically because of the internal factors. However, at the same time, while the internal factors determine the person’s choice of becoming a teacher, the external factors have negative impacts on the job satisfaction of teachers and possible change of career (Perie & Baker, 1997).

Very many factors influencing job satisfaction are mentioned, and they are classified very differently. Studies of job satisfaction include studying of employee satisfaction with various job-related factors, such as supervision, colleagues, working conditions, salary, responsibility, job itself, advancement, security, recognition.

The opinions of the authors differ when analysing understanding of the quality of education. Some authors consider quality of education to be meeting the set goals (Winch & Gingell, 1999), while others describe it as quality of a process (Urwick & Junaidu, 1991; Chapman & Adams, 2002; Coates, 2009). Thereby, opinions about the evaluation of the quality of education are also different. Literature analysis lead to a conclusion that research into quality of education requires capturing as wide a range of opinions expressed by the individuals involved in the sector as possible (Koče, 1999; Coates, 2009) because, depending on the position the person is in, quality of education is perceived differently (Stephens, 2003); it is necessary to evaluate it by covering as wide areas as possible – the process of teaching and learning, the results, the environment, the management of the school, and the overall context of education in the state. To obtain a maximum impartial evaluation of the quality of education, it should be evaluated both internally and externally (Coates, 2009; Kristofersen, Sursok & Vesterheiden, 1998).
internal evaluation is done by the employees of the education institution who provide some kind of self-evaluation, and the external evaluation is done by independent experts.

The fundament for improving quality of education is assurance of material resources (Coates, 2009), financial support, quality working environment, and a quality study process. A conflict arose in the fact that, currently, it is not feasible to assure sufficient financial support, but, at the same time, it is vitally necessary to ensure a high quality of education. This conflict between the input and the expected result makes to seek alternative ways of improving the quality of education. One of such alternatives might be improving the activities of the pedagogical personnel by assuring they have working conditions that facilitate their job satisfaction.

The focus of this research is the improtance of teacher’s job satisfaction in the process of assuring quality of education.

Methodology of Research

Schools with radically different achievements of upper secondary school pupils in the mandatory centralised national examinations were selected for the research. The data provided for the results of the centralised examinations in academic year 2009/2010 (VISC, 2010) by the National Centre for Content of Education and Examinations (VISC) were used to select schools with the highest centralised examination scores in the mandatory subjects established by the Cabinet of Ministers for academic year 2009/2010 (Cabinet Regulation No. 1339) – foreign language, mathematics and the Latvian language and literature in programs in the Latvian language (in national minority schools, examination results in the same subjects were used, but the results of the examination in the Latvian language and literature were replaced with those of the examination in the Latvian language and literature in national minority school education programs) and schools with the lowest centralised examination scores demonstrated by the pupils.

To select the schools, the levels achieved in each of the mandatory centralised examinations were calculated, and the schools were ranged in descending sequence. After that, the schools appearing in all three lists were selected.

Five Latvian schools with high achievements of the pupils in the centralised examinations and six Latvian schools with low achievements of the pupils in the centralised examinations agreed to participate in the research.

Sample, Instrument and Procedure of Research

In all schools which agreed to participate in the research, all teachers preparing pupils for a centralised examination subject (in total 49 teachers) and all pupils (in total 402 pupils) who took the centralised examinations in 2010/2011 were asked to fill in the questionnaire.

In the selected schools, the teachers preparing pupils for the centralised examinations were asked to fill in two questionnaires: Teacher Job Satisfaction Questionnaire developed by P.E. Lester in 1984 and Education Quality Questionnaire.

The pupils were to fill in the Education Quality Questionnaire to evaluate the work of one teacher of their free choice who prepares pupils for the mandatory centralised examinations at the end of the year.

Data Analysis

Data were analyzed using the statistical programs SPSS version 19. The Cronbach’s Alpha method were used to verify the internal consistency of the questions and scales used in the research.

Initially, the internal consistency was verified for all questionnaires used in the research.
To ensure analysis of the obtained data by scales, the Cronbach’s alpha was calculated also for each scale of the questionnaire separately:

### Table 1. Data reliability for questionnaire scales.

<table>
<thead>
<tr>
<th>Teachers Job Satisfaction Questionnaire Scales</th>
<th>Education Quality Scales (teachers’ questionnaire)</th>
<th>Education Quality Scales (pupils’ questionnaire)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supervision</td>
<td>Study environment and psychological comfort</td>
<td>Study environment and psychological comfort</td>
</tr>
<tr>
<td>Advancement</td>
<td>Organisation of the study process</td>
<td>Organisation of the study process</td>
</tr>
<tr>
<td>Working Conditions</td>
<td>Evaluation of the development and achievements of the pupils</td>
<td>Evaluation of the development and achievements of the pupils</td>
</tr>
<tr>
<td>Specifics of job</td>
<td>Professional development of teachers</td>
<td>Professionalism of teachers</td>
</tr>
<tr>
<td>Salary</td>
<td>Management of the school</td>
<td>p=0.890</td>
</tr>
<tr>
<td>Responsibility</td>
<td>p=0.610</td>
<td></td>
</tr>
<tr>
<td>Colleagues</td>
<td>p=0.611</td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td>p=0.495</td>
<td></td>
</tr>
<tr>
<td>Recognition</td>
<td>p=0.373</td>
<td></td>
</tr>
</tbody>
</table>

Relying on the Cronbach’s alpha measurements reflected in Table 1, the instruments used for the research are valid for evaluation of job satisfaction of teachers and quality of education.

To check if the data correspond to the normal distribution, the Kolmogorov Smirnov test was used for the teacher job satisfaction and education quality surveys, all scales were analysed. The results of the data analysis lead to a conclusion that the variables are not normally distributed and for the further research to find out the statistical dependence between two variables the Spearman’s rho was used.

### Results of Research

To reflect teachers’ job satisfaction descriptive statistic were used. An analysis of the year 2011 data about teachers’ job satisfaction shows that teachers are mostly satisfied with their profession. Figure 1 reflects the job satisfaction scales evaluated by teachers.
Figure 1: Teacher Job Satisfaction Scales Evaluated by Teachers (%).

As shown in this figure, the scale teachers are most dissatisfied with is the salary. Most (61%) of the surveyed respondents are not satisfied with their salary, and 6% are entirely dissatisfied. 33% of the respondents have given a neutral rating for their salary, only 6% of the respondents believe their salary is sufficient, but, at the same time, none of the respondents is entirely satisfied with their salary.

Satisfaction with the salary is the only negatively evaluated scale, and this shows that teachers feel materially insecure. The three next scales with the lowest ratings are satisfaction with the opportunities for advancement, satisfaction with recognition, and satisfaction with job security.

Although these scales have lower ratings than the rest, it is important to emphasise that the overall tendency of these scales is positive. More than one half (55%) of the respondents rate their satisfaction with advancement as positive. Answering the question regarding the opportunities for advancement, 41% of the respondents rate them neutrally, and only 4% have given a negative rating for these opportunities. However, at the same time, none of the respondents has rated their opportunities for advancement as very low.

The situation is lightly more negative regarding the rating provided for the scale of satisfaction with job security. However, it should be noted again that the overall tendency remains positive. 43% of the respondents are satisfied with job security, and 2% are entirely satisfied. 49% of the respondents have provided neutral ratings for job security, and only 8% have evaluated job security as negative.

In the context of this research, job security is seen as assurance that the position the individual is holding is stable, and the respondent feels no risks of losing the job. The ratings provided for job security are largely related to the unstable economic situation as well as the education reforms currently being implemented and planned in the state.

The third lowest job satisfaction scale is satisfaction with the received recognition. 51% of the respondents have provided neutral ratings for their satisfaction with the recognition received for their job, 43% have provided positive ratings, and 8% of these have provided a very high rating for the received recognition. Only 6% of the surveyed respondents are dissatisfied with the received recognition, with 2% of the respondents being entirely dissatisfied.

As can be seen in these three described scales, which, against the overall background of teacher job satisfaction, were mentioned as low, the overall tendency is positive, and it should be emphasise that teachers provided positive ratings for all of these scales.
The teacher job satisfaction scale with the most positive ratings provided by the teachers is satisfaction with the level of responsibility and obligations attributable to their profession. All respondents have provided very high ratings for this scale, namely, 78% of the respondents are satisfied with the level of responsibility and the obligations attributable to their profession, and 22% of the respondents are entirely satisfied with this scale.

Similar positive ratings have been provided for satisfaction with the specifics of the job (the job itself) and satisfaction with colleagues. 90% of the respondents are satisfied with the job they are doing (specifics of job), and 6% of these are satisfied entirely. Only 10% believe they are neither satisfied nor dissatisfied with the specifics of the job they have chosen.

The job specifics scale is closely related with teachers’ direct tasks and obligations at work, namely, organisation and planning of the study process, the work with pupils. The specifics of the job are closely related to the responsibility and obligations pertaining to the job of a teacher. The teachers’ high level of satisfaction with the responsibility and the specifics of work show their internal motivation in working with pupils, and such internal motivation ensures higher efficiency and a higher quality of the work.

A very similar positive tendency can be seen in the ratings provided for satisfaction with colleagues. 92% of the surveyed respondents are satisfied with the colleagues they work with. 4% of the respondents are entirely satisfied, and only 8% have provided neutral ratings for their relationship with the colleagues.

The high level of satisfaction with the colleagues primarily shows the positive climate in the schools, and this reflects in positive mutual relationships. Secondly, this very high rating for mutual relationships demonstrates that teachers are very open, friendly, and able to establish and maintain positive mutual relationships with their colleagues.

The remaining two scales (satisfaction with the supervision and satisfaction with the working conditions) also have positive ratings.

69% of the surveyed respondents are satisfied with their supervision, with 4% of them being entirely satisfied. 29% have provided neutral ratings for their satisfaction with their supervision, and only 2% are not satisfied with their supervisor.

Satisfaction with the supervisor also partially shows the positive mutual relationships within the school. Furthermore, satisfaction with the supervision also reflects the high levels of competence of the management and its ability to manage the educational institution efficiently, and this is what teachers do appreciate.

A similar positive tendency is reflected by the ratings provided by the teachers for their satisfaction with the working conditions. 75% are satisfied with their working conditions, and 4% are satisfied entirely. 25% of the respondents have provided neutral ratings for their satisfaction with the working conditions, i.e. they are neither satisfied nor dissatisfied.

Satisfaction with the working conditions is related to the evaluation of the physical and the psychological environment. The obtained data lead to shows that the teachers are very satisfied with the psychological climate within the team and in the school, reflected in the high ratings provided for the colleagues and the management. At the same time, the teachers are satisfied with the available study materials and the aesthetic and physical environment in the school.

**Correlations between Teacher Job Satisfaction and Quality of Education**

To find statistical dependence between quality of education and teacher job satisfaction Spearman’s rho was performed.

Correlation was performed separately for the teachers of the schools with high achievements of the pupils in the centralised national examinations and separately for the teachers of the schools with low achievements of the pupils in the centralised national examinations.
An analysis of the correlations between teacher job satisfaction and quality of education in schools with low achievements of the pupils in the centralised national examinations shows that there is practically no correlation between the aspects of teacher job satisfaction (Table 2) and those of quality of education, except two statistically significant correlations:

- Correlations between the job satisfaction scale: responsibility and several aspects of the education quality criterion: management of the school ($r=0.6; p=0.01$) and professional development of the teachers ($r=0.7; p=0.06$).

The correlations between teacher job satisfaction and the ratings provided for the management of the school might be explained by the distribution of the obligations because the management of the school is the body that can either release the teacher from part of responsibilities or, on the contrary, delegate too much responsibility.

This correlation is related to the teachers' willingness for self-development. The teachers see correlations between improving of their professional skills and self-development. By improving their professional development, the teachers are able to perform their job on higher levels of quality and, thereby, feel more responsible for their job.

**Table 2. Correlation between teachers job satisfaction and quality of education in schools with low student achievement.**

<table>
<thead>
<tr>
<th>Responsibility</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Management of the school</td>
<td>0.598 (0.014)</td>
</tr>
<tr>
<td>Professional development of teachers</td>
<td>0.655 (0.006)</td>
</tr>
</tbody>
</table>

*Note.—Data are Spearman correlation coefficients, with p values in parentheses. Only parameters for which correlations were significant are displayed.*

At the same time, an analysis of the correlations between teacher job satisfaction and the quality of education in schools with high achievements of the pupils in the centralised national examinations shows that these schools have a lot more correlations between job satisfaction and quality of education than in the schools with low achievements of the pupils (Table 3).

**Table 3. Correlation between teachers` job satisfaction and quality of education in schools with high student achievement.**

<table>
<thead>
<tr>
<th>Management of the school</th>
<th>Supervision</th>
<th>Colleague</th>
<th>Work condition</th>
<th>Salary</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organisation of the study process</td>
<td>0.551 (0.001)</td>
<td>0.488 (0.004)</td>
<td>0.397 (0.022)</td>
<td>-0.349 (0.046)</td>
<td></td>
</tr>
<tr>
<td>Evaluation of the development and achievements of the pupils</td>
<td>0.479 (0.005)</td>
<td>0.405 (0.019)</td>
<td>0.344 (0.050)</td>
<td>0.508 (0.003)</td>
<td></td>
</tr>
<tr>
<td>Professional development of teachers</td>
<td>0.473 (0.005)</td>
<td>0.412 (0.017)</td>
<td></td>
<td>-0.363 (0.038)</td>
<td></td>
</tr>
</tbody>
</table>

*Note.—Data are Spearman correlation coefficients, with p values in parentheses. Only parameters for which correlations were significant are displayed.*
There are several correlations between the education quality criterion “school management” and various aspects of job satisfaction: satisfaction with the direct supervisor ($\rho=0.6$ $p=0.001$), satisfaction with colleagues ($\rho=0.5$ $p=0.004$), satisfaction with working conditions ($\rho=0.4$ $p=0.02$).

The correlations between the management of the school and the direct supervisor, the colleagues and the working conditions are logical because specifically these factors characterise the management of the school. Positive relationships with the supervisor are the determining factor which influences a positive rating for the management of the school, and, at the same time, successful school management may influence formation of positive relationships between the principal of the school and the teachers as well as also between colleagues; positive mutual relationships help to ensure higher efficiency at work and, thereby, to raise the quality of education.

The management of the school can also influence the working conditions most directly. Working conditions mean the qualitative and aesthetic physical environment, wide and available equipment, organisation of the working process, and assurance of a positive emotional environment.

It is interesting that there is a negative correlation ($\rho=-0.3$ $p=0.05$) between satisfaction with the salary and education quality criterion “school management”.

Such negative correlation shows that the more dissatisfied teachers are with the salary, the more positive they are in their ratings provided for the management of the school. Very much possible that such situation could be related to the fact that the teachers, being aware of their salary, are informed or have an idea about the salary received by the management of the school and believe it is insufficient. When evaluating the school management’s obligations, tasks and their input and effort in relation to their salary, the teachers are more positive in their ratings for the management of the school.

There are several correlations between the education quality criterion “organisation of study process” and various aspects of job satisfaction: satisfaction with direct supervisor ($\rho=0.5$ $p=0.005$) and satisfaction with responsibility ($\rho=0.5$ $p=0.003$) and satisfaction with colleagues ($\rho=0.4$ $p=0.005$) and satisfaction with working conditions ($\rho=0.3$ $p=0.05$).

The correlation between the organisation of the process of studies and satisfaction with the direct supervisor is natural because for a teacher, when they organise the process of studies, it is essential to receive support from the supervisor, and the more positive this support and also the mutual relationships are, the more efficient is the organisation and the course of the study process.

The correlation between the organisation of the process of studies and satisfaction with the colleagues might be explained by the significance of the positive mutual relationships. Positive relationships with the colleagues facilitate not only provision of mutual support, but also mutual sharing of experiences, which enables to organise the process of studies on a higher level of quality and more efficiently.

Satisfaction with the working conditions plays a role in the organisation of the study process because working conditions are related with the available resources. And, the more diverse and qualitative the study resources available to the teacher, the higher the quality of the study process organised by the teacher.

A relatively unexpected is the finding that the evaluation of the pupils' progress and their achievements, which is one of the criteria of quality of education, correlates with only one of the job satisfaction factors – satisfaction with received salary. Furthermore, this correlations is negative ($\rho=-0.4$ $p=0.04$).

The said correlations show that the more dissatisfied the teachers are with the salary, the more they invest effort and time in evaluation of the progress and the achievements of the
pupils. Such situation might be related to the fact that evaluation of pupils is mostly individual and the progress and the achievements of each pupil are viewed separately. Therefore, when evaluating the development of their pupils, the responsibility of the teacher is specific for each pupil, and, at that moment, the received salary becomes a secondary factor to the teachers.

At the same time, the progress of the pupils is usually evaluated using their practical work and homework teachers typically correct and analyse outside the working hours. It is very likely that the teachers do not quite relate this work outside their working hours to the salary they receive.

✓ There are several correlations between the professional development of teachers, which is a criterion of the quality of education, and the job satisfaction factor „satisfaction with direct manager” (ρ = 0.5 p = 0.005) and „satisfaction with colleagues” (ρ = 0.4 p = 0.02).

The close correlation between the teachers’ professional development and the direct supervisor is natural because it is the supervisor who can most largely influence the teachers’ opportunities for improvement of their professional performance.

Similar to the explanations for the correlations between the organisation of the study process and satisfaction with the colleagues, it is possible to explain the correlations between the professional development of the teachers and their satisfaction with the colleagues. Namely, positive relationships with the colleagues facilitate not only provision of mutual support, but also sharing of information about the opportunities available to improve the professional performance.

Discussion

A conclusion drawn from the results is that teacher job satisfaction is positive, and literature analysis allows to conclude that the high degree of satisfaction assures also a higher efficiency at work (Petty, McGee & Cavender, 1984).

Several authors emphasise that the work of an individual is influence by internal and external motivating factors (Sharma & Jyoti, 2006; Furnham, 2005). The internal motivating factors are much more significant and have stronger impacts on the quality of work. These factors are related to the areas personally significant to the individual, and, furthermore, this personally significant area is different for each individual; for some it is salary, for some it might be achievements, while for some others it is the social relationships etc. For employees, it is essential to receive recognition that matches their personally significant area. In the research, it was concluded that the teachers are mostly satisfied with their job. The only job satisfaction scale the teachers rated very low was satisfaction with the salary, and this leads to conclusions that teachers mostly consider all other job-related aspects, and the received salary is not the most import aspect in this profession.

It should be noted that statistically significant correlations between teachers’ satisfaction with their salary and the quality of education exist only in two education quality criteria – school management and evaluation of the progress and achievements of the pupils. The found weak correlations between satisfaction with the received salary and the education quality criteria lead to conclusions that although, in their opinion, the teachers receive inadequate salaries for the work they do, this does not have significant impacts on the quality of their work. At the same time, it should be noted that insufficient salary may be a reason why teachers leave their jobs.

According to Herdzberg’s (1993) Two-factor Theory, the external influencing factors, which include also the salary, do not appear to be a performance-improving factor, but serve as an imperfection-eliminating one. The salary is not a motive that improves motivation for work, but, at the same time, the received salary is the only means of meeting the basic needs. According to Maslov (1954) and Alderfer (1972), it is not possible to satisfy higher level needs
for a long time without satisfying the basic needs. Relying on Adams’s (1965) theory of justice, it may be assumed that, without a sufficient salary, teachers might, for instance, put less effort into assurance of a quality process of studies or, for example, quit the profession due to lack of anticipated appreciation.

An analysis of the correlations between teacher job satisfaction and quality of education lead to conclusions that there are higher numbers of and statistically more significant correlations in the evaluations provided by the teachers from the schools with higher achievements of the pupils.

Statistically significant and high numbers of correlations were found between the management of the school or the direct supervisor and various aspects of job satisfaction. The found correlations allow to conclude that the teachers feel a necessity for a competent and supportive school management which is able not only to manage and organise the operation of the educational institution efficiently, but also appreciate the work done by the teachers and form a cooperative and positive working environment.

Conclusions

- Teacher job satisfaction is an essential component of the quality of education, and there are close correlations between them. Teacher job satisfaction determines their interest, motivation and attitude towards work, which thereby influence the professional performance of the teacher and, through this, also the quality of education.
- The overall teacher job satisfaction is high, and the only job satisfaction scale rated low by the teachers is satisfaction with the salary.
- Satisfaction with the received salary is an external motivator, which does not act as a primary determinative factor, but, at the same time, satisfaction with the received salary is one of the means of meting the basic needs.
- The dominating correlations between the criteria of job satisfaction and those of quality of education revealed during the research are related to interpersonal relationships, the specifics of job, and satisfaction with the working conditions. This leads to conclusions that, in order to improve the quality of education, it is primarily necessary to improve the internal factors of job satisfaction.

Acknowledgements

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

References


*Advised by Andrejs Raufvargers, University of Latvia, Riga, Latvia*

Received: *September 24, 2011*  
Accepted: *October 22, 2011*