

Research of Quality of Life of Informatics Students Through Innovative Application

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Abstract: - The article deals with the current population's quality of life standard. It compares the relation between the beginning and the end of university studies and between university students of two towns in the Czech Republic. It follows up Vital Mind project which was going on at University of Hradec Králové. It presents the results of the research carried out in five years as a part of students' projects. More than one hundred and fifty university students participated in the study. It was conducted in 4 groups of respondents. To assess the quality of life standard the method of subjective questioning SEIQoL based on a guided interview was used. The study provides an innovative newly created application for the online electronic completion and evaluation of the questionnaire.

Key-Words: - Database, life satisfaction, methods of mental health diagnostics, web application, theories of quality of life, informatics students.

1 Introduction

Life satisfaction, an important indicator of positive psychological well-being, has been defined as a cognitive evaluation of one's overall life or important domains [1]. This study focuses on the life satisfaction of university students of two regions – the country capital Prague and the regional capital Hradec Králové.

Although the few studies of young people have revealed similar findings, most studies have used small-scale samples, limiting their generalization [2].

The studies have suggested that most youth experience positive, overall life satisfaction. However, some studies revealed significant, although small differences related to gender, ethnicity, and socioeconomic status [3]. Most studies employed global measures, failing to differentiate among life satisfaction domains [4].

One exception involved a study of 5545 high school students in South Carolina, U.S.A. Most of these high students reported positive life satisfaction, with respect to global and domain-specific life satisfaction. Although small, race and gender effects emerged for specific domains. Further, a significant number of students reported considerable dissatisfaction with school experiences, suggesting particular concerns for this major life domain. Given differences in cognitive,

social and emotional functioning in early (versus later) adolescence, it is possible that the levels and correlates of life satisfaction differ across the two age groups. Thus, large-scale studies of life satisfaction of the adolescents are needed. [4]

The Vital Mind project at FIM UHK [5] and the issues that are studied in it can be included in the area of Mental Hygiene which is currently heavily involved with *methods of mental health diagnostics*.

These methods focus on the area of overall life satisfaction (in particular the satisfaction in a relationship, family and personal life satisfaction) and then on the state of vitality, the overall feeling of health. In contrast there are presented the states of anxiety, serious problems in life crises or emotional problems and states of depression. Other monitored areas include the ability of self-control and the state of social health, characterized primarily by the number of closed friends, frequency of social contacts and the possibility to discuss one's personal problems with close friends. Considering the mentioned overview of the subjects and the mental hygiene focus we can conclude that most of the matters studied by this discipline belong to the issues of Psychology of health. [6]

Mental hygiene and psychology of health thus target empirically detectable and experimentally observable phenomena which relate to strengthening and maintaining *mental health*. So we approach the

selected subject of our study from the position of a wider, holistic concept of a complex human, including ethical issues of human existence and quality of life.

1.1 The concept “Quality of life”

The concept “Quality of life” can be traced back to the Greek philosopher, Aristoteles. He described quality of life in terms of the concept of happiness, experienced when everything works well and the soul is satisfied. Since “life” is the thing everyone leads, pursues and is concerned about, quality of life has been studied extensively. [7]

In the last decades there has been a growing interest towards the concept of “Quality of Life” (QoL), not only in the bio-medical field, but also in other areas, such as sociology, psychology, economics, philosophy, architecture, journalism, politics, environment, sports, recreation and advertisements. Nevertheless, QoL does turn out to be an ambiguous and elusive concept – a precise, clear and shared definition appears to be a long way off. [8]

The quality of life can be defined from various points of view. According to the World Health Organization WHO the quality of life is the answer to the question, *how a person perceives his/her position in life in the context of his/her culture and value system*. It also takes into account the objectives, expectations and standards of a person. [9]

WHO recognizes six basic aspects of the quality of life: *physical aspect and the level of autonomy* (the assessment of the amount of physical fatigue, pain, mobility, dependence on medical assistance, ability to work), *psychological health and intellectual realm* (self-concept and self-esteem, the ratio of negative and positive experience, the function of thinking, memory and the ability to concentrate, but also personal faith and spirituality), *social relationships* (personal relationships, intimate life, sources of wider social support) and *the environment* (financial sources, accessibility of medical and social care, conditions of home environment as well as external physical conditions – climatic conditions, amount of pollution, noise). [9]

The quality of life can be considered at different levels [10] – at *macro-level* we study the quality of life of large social units (people of a particular country), at *meso-level* we are interested in the quality of life of small social units (students at university). The third *personal level* monitors directly the life of an individual – here the subject of

study of the quality of life can be a person’s way of experiencing and thinking, his/her attitudes, needs and wishes, self-evaluation or the amount of self-realization. Also negative aspects can be included in this level (the amount of pain during an illness, emotions of sadness during a personal crisis or life trauma).

The quality of life can also be viewed from the *objective or subjective* perspective. While the objective aspect reflects the living conditions of a particular person (state of health, socio-economic status), the subjective aspect constitutes the amount of his/her personal well-being and life satisfaction. To assess a man’s quality of life it is important to know the value system of an individual and his/her different expectations. We also have to know in detail to what extent his/her expectations are in accordance with the reality of life seen from the subjective point of view, this means the way his/her life is going on in reality. In connection with that positive psychology emphasizes the importance of seeking and understanding the factors which contribute to a good, meaningful life and human happiness [11].

In the Czech Republic the issues of measuring the quality of life are dealt with by J. Krivohlavý [10], [12] in his works. He introduces three basic groups of methods used in measuring the quality of life – *objective* (e.g. verbal evaluation according to given criteria), *subjective* (an interview, a self-evaluating questionnaire) and *mixed* (a combination of previous two groups). The majority of methods are designed for the adult population, however there are also quantitative and qualitative methods for detecting children’s and adolescents’ quality of life.

The original concept of *optimal experience* was presented by M. Csikszentmihalyi [13]. He proposed the term *flow* – immersing oneself in an activity. According to this concept a good and happy life is characterized by the frequency and intensity of the *flow* experience, complete immersion in what we are currently doing, devotion to a present moment. Happiness is not an accidental state dependent on external conditions but an internal process which we can cultivate and maintain – “*being able to be happy*”. The quality of life here is closely related to the ability to control one’s consciousness and the art of establishing internal harmony. From our life we deliberately remove obstacles that prevent us from the feeling of inner fulfilment. It is about the ability to get the most pleasure and satisfaction in everything we do.

The summarising results of numerous scientific studies on the subject of human satisfaction and

happiness [11], [14], [15], [16] imply that the happiest people:

- spend a lot of time with their loved ones, family members and friends and they maintain good relationships with them
- feel and express their gratitude for everything they have
- offer their help willingly and responsively when it is needed
- see their future optimistically
- can enjoy and relish the good things that the present moment brings
- are physically active, they usually do regular exercises
- have their long-term objectives and plans
- naturally also face problems and experience conflicts and discomfort but they manage to get over difficult periods in their life more easily because they are able to learn from them

Huebner, E. Scott says, that for life satisfaction are important five specific domains – family, friends, self, school and living environment. [17]

1.2 Current theoretical approaches to quality of life

In the scientific world the concept of quality of life began to be used in the sixties of the 20th century. At the time public officials and experts from many fields of human activity admitted that *it is not the quality of goods and services that matters to the humankind but the quality of life of individuals* [18]. This means that the quality of life as we know it today is a reaction to problems associated mainly with so called *paradox of affluence* [19] and with the finding that the economic benefit does not bring only positive effects but at the same time it is also the source of social, economic and environmental problems (limitation of mineral resources, environmental pollution, growing economic inequality of the population). Interest in the quality of life is therefore strongly linked to the achievement of a certain level of material prosperity and its focus is found mainly in developed societies. These countries have realized that the quality of life depends on many other aspects than just purely economic and material factors.

Quality of life is for its interdisciplinary overlap a hot issue for experts from many scientific fields. We come across this concept in medicine, primarily in connection with the quality of life of patients. Psychologists, educators, sociologists, economists

and geographers are also interested in it. Each scientific discipline attributes different characteristics to quality of life and approaches it from its own specific perspectives. Thus a number of quality of life definitions have come into existence. They either prefer subjective concept which depends entirely on individual perception of a person or objective concept which is shaped by a variety of life conditions. The third concept also comes into consideration. It is interdisciplinary, multidimensional and combines both subjective and objective concept. The following text presents examples and evaluation of all three theoretical approaches.

1.2.1 Subjective theories

Raphael [20] in his *subjective theory* equates the quality of life of an individual to the satisfaction with utilizing all options of life that have gained main importance for him/her. Incorporation of “the options” into quality of life, that at the same time indicate opportunities and limitations of an individual, meant that this approach acquired a highly individualistic character [20]. Quality of life according to Raphael is a holistic and multidimensional concept arising through interaction of personal and environmental factors as well as opportunities for development of skills. This approach is expressed by means of a *structural model* (see Table 1). Thus quality of life is a summary of the following: who we are in personality and physiological respect, how we fit into our environment and what activities we do for self-realization and self-development. [20]

Table 1 building components of quality of life according to Raphael [20]

| Domains | Subdomains |
|--|---|
| Being (who I am) | <ul style="list-style-type: none"> • Physical – physical health, exercise etc. • Psychological – mental health, emotions etc. • Mental – personal values, opinions etc. |
| Belonging (how a person fits in the environment) | <ul style="list-style-type: none"> • Physical – home, work, school, neighbourhood, community etc. • Social – family, friends, neighbours etc. • Societal – income, health, employment, social services, education etc. |

| | |
|--|---|
| Becoming (purposeful activities to express oneself and achieve personal goals, aspirations and hopes) | <ul style="list-style-type: none"> • Practical– daily activities like household chores, paid job, school etc. • Free time – relaxation and stress reducing activities • Growth – maintaining and improving knowledge and skills and adaptation to change |
|--|---|

Raphael’s structural model focuses on an individual, is universal in the sense of its applicability to anybody regardless of their physiological condition. It can be used for realistic comparison of quality of life between people with different living conditions. This theoretical approach is very wide and thus respects the complexity of the quality of life concept. The quality of life is according to him influenced by the interaction of personal, interpersonal and environmental aspects of human life as well as by an individual’s utilization of possibilities in “Becoming” domain. [Phillips, 2006:38].

1.2.2 Objective theory

Needs and their satisfying are the central theme in the economic approach to the human being. Many economic theories of quality of life are also based on the concept of needs. *Objective theory* – theory of human needs by Doyal and Gough – speaks about the right of every human being at least to ensure an acceptable life by providing food, water, shelter, basic health services and education. This approach is characterized mainly by an ideological emphasis on the commitment of society to meet the needs of individuals. The second characteristics is that the approach is based on the existence of objective needs whose satisfying is in the interest of every member of society [Doyal and Gough, 1998 in Phillips, 2006:86]. The authors argue that every individual regardless of his/her cultural or social background seeks social participation and also wants to avoid serious damage in life. From these contact points two universal human needs are derived: *physical health* and *autonomy of activity*. Their satisfaction is subject to optimal satisfaction of eleven, so called auxiliary needs that positively contribute either to health or an independent activity of a human [Phillips, 2006:87-88]. Processing of this approach is shown in Table 2.

Table 2 quality of life in relation to theory of human needs [20]

| Quality of life | |
|-----------------------|---|
| Basic universal needs | Auxiliary needs |
| Physical health | <ul style="list-style-type: none"> • Nutritious food and clean water • Safe housing • Non-hazardous working environment • Non-hazardous physical environment • Safe contraception and upbringing of children • Adequate health care |
| Autonomy of activity | <ul style="list-style-type: none"> • Safe childhood • Good level of primary relationships • Physical safety • Economic security • Adequate education |

From Table 2 we can see that a clearly formulated and completely objective theory of human needs enables to evaluate quality of life regardless of cultural values of the place where a person lives and is universally applicable across different societies. [20].

1.2.3 Interdisciplinary theory

Felce and Perry introduced *interdisciplinary theory* – with a model of quality of life where they acknowledged multi-dimensionality of the concept by determining five key dimensions. According to them the overall quality of life consists of *physical, material, social and emotional well-being and of human development and activity* [21]. Each of the dimensions is created by objective conditions of life. However, at the same time, the resulting quality of life reflects subjective satisfaction of an individual with each dimension and it also reflects the importance that an individual attributes to a particular dimension in his/her life through his/her personal values and aspirations. Fig. 1 shows that the authors did not even omit the influence external conditions. They attributed dynamics to the quality of life. The dynamics is expressed by the mutual interaction of elements of objective conditions, subjective perception and value system and by aspiration. For example, there may be a change in an objective component, which results in a change of satisfaction, value system or even both. Similarly, a change in the value system may lead to the change in satisfaction and the change in some objective circumstances. Last but not least, a change in subjective satisfaction may bring about the

reconsideration of lifestyle as well as the value system of an individual. These three elements can obviously change also independently or as a result of external influences – for example genetic makeup, age, material inheritance, employment and other social, economic and political variables. The relation between the three components – objective conditions, subjective perception and the value system is not constant in any case. That requires the necessity to determine always all three components and eliminates the possibility of their anticipation based on the knowledge of one set only [21]. Quality of life is not in the author's view a constant quantity and it changes in the course of time.

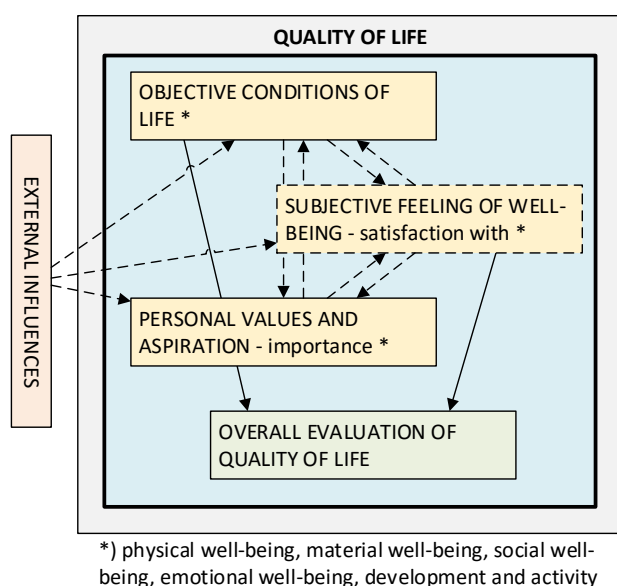


Fig. 1 compact concept of quality of life [21]

This theoretical model was developed with the objective of general applicability to various groups of people, regardless of their precise characteristics, thus with the objective of possible application to the whole population [21]. To implement the model into practice requires elaborating a measuring technique to determine objective aspects of well-being, personal development and activity, elaborating methodology to obtain subjective evaluation and an appropriate research. It remains the problem whether people with a communication deficit and cognitive limits have a sufficient ability to respond adequately to the assigned questions and express their feelings accurately. [21].

2 Methodology of research

The case study of this work focused on the quality of life uses the questionnaires of SEIQoL method. This method gives an insight into the individually

perceived quality of life. Its principle lies in the fact that the respondent is asked about five most important areas in his/her life. The examples of the areas are health, family and education. The person selects the areas that make him/her happy, goals he/she wants to achieve. Important life goals which a person is aimed at and to achieve them he/she uses smaller goals. [22]

SEIQoL method – The Schedule for the Evaluation of Individual Quality of Life was created in 1994 [23]. It is characterized by five principles:

- defining the qualities of life by a respondent
- a respondent's evaluation of his/her life
- determining the importance of individual aspects by a respondent
- the evaluation is relevant at a given time and at some other time respondent can indicate different values and aspects
- the aspects indicated by a respondent can be medical, psychological or any other aspects

During the evaluation five most important aspects of life are taken into account and the less essential ones are not mentioned. The aspects represent respondents' life goals. That is what they live for, what makes their life better, what gives the meaning to their life, what they hope for and aim all their energy at. At the same time, we detect what importance is given to these aspects by a respondent.

The most suitable way of detecting is the analysis of subjective views and conviction that is *judgement analysis*. In the interview with a respondent the questioner helps to define the importance of the aspects.

Later the authors derived a simplified way called SEIQoL-DW (DW means *direct weighting*) where a five-colour disc is used (see Fig. 2). The respondent indicates the importance of the aspects by shifting the sectors. The bigger a sector is the bigger importance it has.

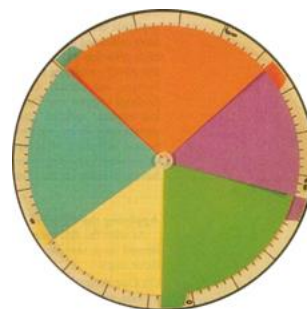


Fig. 2 colour disc of SEIQoL-DW method [24]

Compared to the work with the colour disc the division of a *hundred percent scale* into corresponding sections requires bigger amount of imagination and calculation. There is also the option to talk to respondents and leave the completing itself up to them. There is no tendency to influence or direct respondents, so they do not feel the need to make themselves better during the interview.

An individual completing is suitable in a collective research when individual interviews would take too much time. Here after completing the questionnaire the researcher can ask additional and specifying questions.

A. M. Hickey [24] and his team say that the SEIQoL method is generally applicable and highly valid. He also presents the difference between the fully-fledged method and the simplified Direct Weighting. DW measures only the areas which the respondent realizes in comparison with the fully-fledged method measuring also implicit elements which are not realized by a respondent.

The quality of life was first monitored among sick patients. Thus the result showed the idea of a patient's view of his/her life in the period affected by the illness. At the same time, it was possible to follow the development during the illness. But if a researcher is interested in a general quality of life of the studied group, the result can be distorted by worsened cognitive abilities. It is true that *judgement analysis* is the most suitable way of detecting a respondent's preferences, however, due to its routine clinical use the authors have come up with the *direct weighting* (SEIQoL-DW), which is not as demanding for the patients with limited cognitive abilities [23].

It is important to point out that the SEIQoL method is used primarily for *individual diagnostics* of the selected person's situation. It is not suitable to apply it to large units when a social phenomenon or a human characteristic in the society is studied. It is possible to use the method to compare two groups of respondents. We either study one group in the range of time delay or two groups that differ in a specified feature.

2.1 SEIQoL method

SEIQoL method is conducted in the form of a semi-structured interview. First the questioner has to find out the most important areas in the respondent's life. To make it easier the researchers demand 5 areas bearing in mind the fact that the areas represent the most important ones and thus they should reflect the quality of respondent's life sufficiently.

Doing so the questioner has to be aware of a few pitfalls. The respondent does not choose specific objects or people. If the respondent mentions his wife as one of the areas important in his life, the questioner's role is to ask what in particular makes his life happy in connection with his wife. The answer will probably indicate the meaning of sharing time with the beloved person and it is suitable to enter the term "marriage" into the questionnaire. The questioner should avoid influencing the respondent, direct or unintentional inciting him/her or presenting examples in a larger extent than it is necessary. The respondent gives his/her five areas according to which he/she evaluates his/her life. The questioner's role is to find out by using suitable questions whether they are really those most important areas thanks to the respondent feels happier or because of which he/she is not in a good psychological condition. For example, the respondent can claim that one of the essential areas is religion. As a matter of fact the respondent does not mind the faith itself but he/she appreciates the sense of security that the religion gives him. Before both of them move to the part of evaluation the respondent should definitely know what he/she will be evaluating. For example, if the respondent selects work as one of his life themes, the following evaluation may be influenced by the fact that work is important for the respondent but he/she receives insufficient financial reward for doing the work. The questioner can help the respondent to clarify his/her thoughts but the final decision is up to the respondent.

In the situation when the principal areas determining a person's quality of life are selected the respondent is asked to define how he/she is satisfied with each of the areas. The respondent identifies the amount of satisfaction with a particular area which is expressed as a percentage. The questioner ought to make sure that the respondent really expresses the *current perception of satisfaction* with the entered areas and does not think about the importance of the given areas instead.

The next step is *determining the importance of the given five areas*. We ask the respondent to allocate to each selected area a corresponding amount out of one hundred percent. The use of the disc divided into five sectors (see Fig. 2) is easier for the respondent. Each sector has a different colour and they are movable – overlapping. By shifting the sectors the respondent indicates the importance of each area which can be transferred into numeric values thanks to the scale along the perimeter of the disc. As in the previous step the

questioner assures that the respondent really states the personal importance of the selected areas.

In the end we ask the respondent to identify the amount of satisfaction with his/her life in general. The best way how to do it is to prepare a line (“thermometer”) where the respondent marks the place which according to him/her reflects his/her current life situation. To enable the respondent to have a better idea about the significance of the line it is suitable to tilt it at the angle of forty five degrees with the left end at the bottom and the right end at the top.

The assessment of the questionnaire answers is carried out by the following calculation. The satisfaction with the first life area is multiplied by the importance of the first life area. The same calculation is done for the other four areas. These five results are added up and the total is divided by one hundred. This way the value between zero and one hundred is obtained and it can be presented as a *percentage value of the quality of life*. If everything is in order, the result should not differ too much from the value which the respondent marked on the “thermometer” at the end of the questionnaire when he/she was evaluating the overall quality of his/her life. [10]

3 Results of research

3.1 Group of respondents

For the case study the data from four target groups were collected – university students at the beginning and at the end of their studies and university students of two regions – the capital Prague and the regional capital Hradec Králové. 156 people in total took part in the survey and completed the questionnaire:

- university students at the beginning of their studies: 30 students (age from 20 to 21)
- university students at the end of their studies: 30 (age from 23 to 24)
- university students from Prague: 30 (age from 20 to 25)
- university students from Hradec Králové: 30 (age from 20 to 25)
- university students from previous (2010-2012) research: 36

3.2 Graphic processing of results and data interpretation

3.2.1 Prague vs. Hradec Králové

Firstly, we will compare the ranking of life values as it was done by students from the capital Prague and the regional capital Hradec Králové.

Students in both surveyed cities placed traditional values such as *family, studies, friends and work* in the first four positions and in Hradec Králové family was selected as the most important life theme even by all respondents.

| Prague | | Hradec Králové | |
|----------------------|----------|----------------------|----------|
| Life theme | Selected | Life theme | Selected |
| family | 90% | family | 100% |
| studies | 77% | friends | 67% |
| friends | 70% | studies | 60% |
| work | 63% | work | 60% |
| partner relationship | 47% | health | 53% |
| health | 43% | sport | 23% |
| money | 30% | money | 20% |
| sport | 17% | free time | 17% |
| interests | 7% | hobbies | 13% |
| travelling | 7% | partner relationship | 13% |

Fig. 3 comparison of value system of students from Prague and Hradec Králové

From the fifth position on, the values vary both in the percentage representation and in the preference order. Prague students prefer more partner relationship (fifth position) which is placed by Hradec students as far as in the tenth position. Students from Prague also included travelling among the most preferred life values (see Fig. 3)

3.2.2 Beginning vs. end of studies

The following comparison shows the progression of preference development by the age of students, among the first year students at the age of 20–21 and students of the last third year of studies at the age of 23–24 (see Fig. 4).

| 1st year | | 3rd year | |
|--------------------|----------|-------------------|----------|
| Life theme | Selected | Life theme | Selected |
| family | 83% | family | 83% |
| school, education | 67% | school, education | 63% |
| work | 47% | work | 57% |
| financial security | 43% | health | 53% |
| own housing | 37% | friends | 50% |
| travelling | 37% | hobbies | 33% |
| be happy | 33% | own housing | 30% |
| friends | 30% | career | 30% |
| health | 27% | travelling | 27% |
| occupation | 27% | money | 23% |

Fig. 4 comparison of value system of first year students and students of the last year of studies

Preferences of life values in both groups are identical in the first three positions: *family*, *education* and *work*. The values show that students at the beginning of their studies are primarily concerned about *financial security* and *own housing*, while at the end of studies they realize the value of their *health* and the importance of *contacts with friends*.

Money was shifted as far as the tenth position by senior students due to the fact that these students usually earn their own money and they do not have to rely on financial backing from their parents. First year students prefer the theme of *travelling* more than already quite settled students of the third year.

With advancing age the importance of *permanent employment and career growth* increases. More senior students already realize the degree of seriousness connected with the choice of their future profession.

3.2.3 Year 2012 vs. 2015

Now there will be compared the results of a previous research, which was conducted in the years 2010–2012 with 36 university students [25], and the current research from the years 2013–2015, where the total of 120 students participated. Thus the overall number of students who were considering their value system is 156 (see Fig. 5).

| 2010-2012 | | 2013-2015 | |
|------------------|----------|-------------------|----------|
| Life theme | Selected | Life theme | Selected |
| family | 78% | family | 89% |
| self-improvement | 61% | school, education | 67% |
| partner | 53% | work | 57% |
| health | 42% | friends | 54% |
| work | 39% | health | 44% |
| friendship | 36% | money | 28% |
| money | 31% | love | 23% |
| peace of mind | 19% | travelling | 18% |
| career | 19% | own housing | 17% |
| entertainment | 14% | hobbies | 14% |

Fig. 5 comparison of students' value system from the researches in years 2010-12 & 2013-15

When comparing identical researches among university students in 2012 and 2015 the first position is permanently held by the traditional value of *family*. The second position is occupied by the value of *self-development and education*. Other positions are represented by the same values but in different order.

The value of *health* has the constant rate of preferences (42% and 44%) and the value of *money* has the rate slightly decreasing (31% => 28%). Newly the value of *own housing* occurs in the research. It was not represented among the first ten values at all but nowadays it is a concern for 17% of

respondents and also the value of *travelling* is newly added by 18% of respondents.

The importance of *close relationship* held a significant 3rd position in the previously conducted research while in the current group of students it occurs in the 7th position.

3.2.4 Satisfaction with life

When assessing the quality of life the SEIQoL method [10] enables to find out also the subjective perception of life satisfaction. Thus students in the 2012-2015 research could totally evaluate their feelings, attitudes and fulfilled wishes in the certain moment of their life. (120 respondents in total, see Fig. 6)

| | Estimate | Reality | Difference |
|----------------|----------|---------|------------|
| Hradec Králové | 76,0% | 67,8% | 8,2% |
| Prague | 82,5% | 76,7% | 5,8% |
| 1st year | 68,6% | 58,9% | 9,7% |
| 3rd year | 67,7% | 57,9% | 9,8% |

Fig. 6 comparison of estimated and real life satisfaction among four different groups in the 2012–2015 research

On an imaginary thermometer (*Amount of satisfaction with life* - see Fig. 7) the perception was recorded in the range from pessimistic, negative to optimistic, positive life-tuning (so called the state of *well-being*). Looking at Fig. 6 we can say that students from Hradec Králové have the estimated rate of life satisfaction by 8.2% higher than the real rate. Students from Prague have this rate higher by 5.8%. It means that in both cases predominantly optimistic mood of university students has been proved.

This fact is also confirmed in the students who start studying as well as students finishing their university studies – in this group of students the estimated reality differs more from the real one (by 9.7% and by 9.8%) in comparison with the group of students from the selected cities.

3.3 Summary of research results

In the area of life values preferences surveyed students from both cities prefer the identical traditional values of *family*, *studies*, *friends* and *work* in the first 4 places. In Hradec Králové *family* was selected the most important life theme even by all respondents.

When comparing the situation at the beginning and the end of university studies the preference of values in the first three positions is the same – *family*, *education* and *work*. The results show that students at the beginning of their studies are mainly

concerned about *financial security and own housing*, while at the end of their studies they realize the value of their *health* and the importance of *contacts with friends*.

In the group of senior students the value *money* occurs as far as in the tenth position which is related to the fact that these students mostly earn their own money and thus are not dependent only on financial security from their parents. The first year students prefer *travelling* more than already rather settled students of the third year. With the advancing age the importance of *permanent job and career growth* is also increasing. More senior students are more aware of the degree of seriousness when they choose their future profession.

When identical researches in university students from the years 2012 and 2015 are compared the traditional value of *family* permanently occurs in the first position. The second position is occupied by the value of *self-development and education*. Other positions are represented by the same values but in a different order. The value *health* has a constant rate of preferences (42% and 44%) and the value *money* has a slightly decreasing rate (31% => 28%). Newly the value of *own housing* occurs in the research. Previously it was not represented at all among the first ten values but nowadays 17% of respondents are concerned about it, and the value *travelling* is also newly included by 18% of respondents.

The importance of *close relationship* had a significant third position in the previously conducted research, while in the current group of students it occurs as far as in the seventh position.

The applied SEIQoL method enabled to record the perception of life satisfaction on an imaginary thermometer in the range from pessimistic, negative to optimistic, positive life mood (so called state of *well-being*). Students from Hradec Králové show the higher estimated rate of life satisfaction. It is by 8.2% higher than the real rate. Students from Prague show this estimated rate higher by 5.8%. Thus it means that in both cases we can prove *predominantly optimistic mood of university students*.

This fact is also confirmed by students who start their university studies and those who finish them – however the estimated reality differs more from the real one in this group of students (by 9.7% and by 9.8%) – in comparison with the same group from selected cities.

FORM TO FIND OUT ABOUT QL BY MEANS OF SEIQoL METHOD

First name and surname: _____ Today's date: _____ Year of birth: _____

| Importance of the theme in % | Life theme – What are you after in life above all? (5 life goals) | Amount of satisfaction in % (in each line from 0 to 100 %) |
|------------------------------|---|--|
| | 1. | |
| | 2. | |
| | 3. | |
| | 4. | |
| | 5. | |

Total of percentage in all five lines in the left column must equal 100%.

Amount of satisfaction with life:

<-----|-----|-----|-----|-----|-----|----->

It is as bad as it is possible *It is as good as it can be*

Total value of QL: _____

Total amount of satisfaction: _____

Fig. 7 quality of life questionnaire [10]

4 Application for self-testing

Quality of life measuring by means of SEIQoL method is carried out under the assistance of a trained person who explains the procedure to the evaluated person, monitors the validity of all data and categorizes carefully described life themes (especially due to the subsequent statistical assessment). The assistance of this evaluator guarantees better accuracy but on the other hand it makes this test inaccessible to a random applicant.

For this reason we have created an web application for quality of life measuring via SEIQoL method, which can be used not only by professionals for their patients, clients and respondents, but also by anybody who is interested in trying out this quality of life test individually and just for themselves. It can be found on the address <http://qol.alltest.eu/seiqol>.

4.1 Interface


The interface of the application is user-friendly (see Fig. 8) and its use is clear immediately to more experienced users thanks to the brief captions of individual form elements. In case of difficulties in understanding there is more detailed help available under the icon .

Fig. 8 application form for entering data

As the data processing is immediate and fully automated, the user cannot select the life themes through an extensive description but he/she has to categorize them individually at once. That is why the menu of the previously entered categories of life themes is used instead of the common text box. However this menu also enables to enter an entirely new theme. During typing it filters and offers similar expressions (see Fig. 9) in order to minimize the possibility of duplicate entering the same themes under slightly different designations (e.g. “health“ and “state of health“).

Fig. 9 entering life themes with “insinuation” of previously entered categories

Another critical step is the correct completion of importance weight of each life theme. At each importance weight it is entered the value that is to express this importance but their total must be exactly 100. This is to make the user think about his/her preferences and with consideration divide this limited number of points among the individual themes. The validation function of application secures that the total is really 100. This function does not allow to evaluate the form unless this and other data are entered correctly. Nevertheless not everyone is able to use independently the sufficient amount of imagination and divide these points appropriately.

One of the variants of SEIQoL-DW method uses five-colour disc for this purpose (see Fig. 2). The

respondent indicates the importance of the themes by shifting the sectors – the larger sector is set the higher importance the given theme has [24]. This application uses a similar functionality which does not enable to set sectors directly by means of colour disc. However, to make the division of points among the themes more illustrative the application draws the disc in the form of a pie chart (see Fig. 10). This happens during the process of completion without disrupting AJAX functions, immediately after all five themes have been selected and the value of their importance has been entered. This graphic representation thus helps the user get a better idea about the division of points and enables him/her to modify it afterwards.

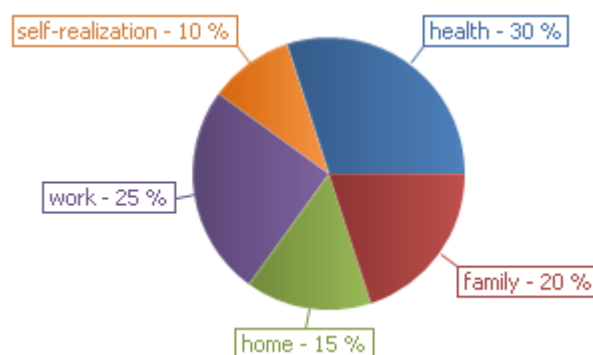


Fig. 10 pie chart illustrating importance of life themes

4.2 Evaluation

After completing all data correctly they are evaluated. The user’s satisfaction with life is calculated by means of SEIQoL method and it is compared with the result which the user estimated (see Fig. 11). The difference between both values is identified and verbally evaluated.

| | |
|---------------------------------------|-----|
| Your estimated satisfaction with life | 73% |
| Satisfaction with life by SEIQoL | 64% |
| Difference | 9% |

Fig. 11 table evaluation of estimated and calculated life satisfaction

Both values of satisfaction have their graphic representation in the disc diagram (see Fig. 12). Here we can see very well how the individual values are ranked in this scale and how they compare to each other. For better orientation the scale is at the same time divided into five basic zones which categorizing the quality of life according to the satisfaction with life.

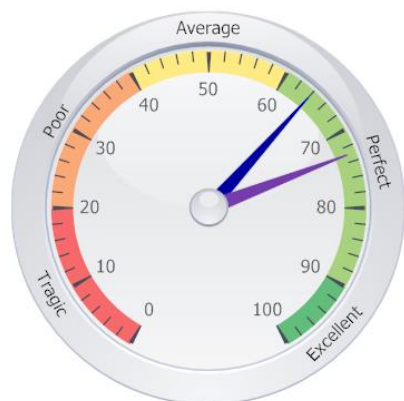


Fig. 12 graphic evaluation of estimated and calculated quality of life

The difference between the estimated and calculated life satisfaction is also depicted. This difference has its significance and according to its extent it is included into an appropriate category expressing the user's ability of self-evaluation. The extent of this difference and its categorization is illustrated by this picture (see Fig. 13).

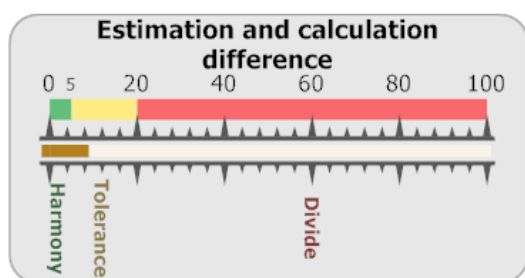


Fig. 13 graphic evaluation of difference between estimated and calculated life satisfaction

The data entered by users are simultaneously saved to a database in real time. Then the user obtains a generated unique code added to the link where he/she can see his/her evaluation at any time later. Moreover the saved data will be used for their later statistical assessment and further research in this field.

For the future we plan to extend the assessment of each measurement by adding the comparison of individual values with the averages of results from the other respondents. The user thus gets information how his/her values compare to those of the whole population, the same age group, the same sex, etc.

5 Conclusion

The search for answers to the question "How to lead a good life?" already occupied ancient philosophers. However, quality of life exploring started as late as

in the 20th century. Currently there are three basic approaches to the quality of life. The economic approach reduces the quality of life to satisfying consumer preferences. The sociological approach equates the quality of life with the fulfilment of the idea about a desirable social development. According to the psychological approach the quality of life is defined on the basis of subjective ideas of individuals. Interdisciplinary approach to the quality of life and its research is desirable and it is nowadays applied mainly by various independent research centres – e.g. Australian Centre on Quality of Life, Quality of Life Research Unit and others. All the effort connected with recording the quality of life is socially beneficial because a high-quality life is the goal for each of us.

Our research in university students at the age of 20–24 confirmed the preference of traditional life values – family, education and work. The value of health has a constant rate of preference and the value of money shows a decreasing rate of preference. The values of own housing and travelling occur newly in the latter research. In the area of life satisfaction a predominantly optimistic mood of the surveyed students was proved, both of students from various university cities and of students beginning or finishing their studies.

Until now measuring the quality of life by means of SEIQoL method has been going on only through the subjective questioning in the printed form and with the assistance of a questioner. Now a new application has been created. It enables to carry out this measurement in the electronic form and quite individually by a surveyed person. Another advantage is an immediate automated assessment with the possibility to compare one's result with the other users of the application. Moreover, thanks to this form of data collection our research can be extended to a large number of other respondents.

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