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Education in the information society

Occurrence of information society has contributed to the increasing importance of professions related to computing as well as information and communication technologies (ICT). On the other hand, we are now facing new problems since some of the processes in the society cannot keep up with the pace. Moreover, if we do not act with determination and in a timely manner, we can expect the gap to widen even further. A clear warning in this respect has been issued by the International Federation for Information Processing (IFIP) in a declaration passed this September at a world IFIP congress held in Milan. The warnings refer to a big decrease of computing graduates and small numbers of high school students who choose to take computing courses at a higher level. The adverse effects have already been recognized by the employers in the ICT industries and schools. These observed changes cannot be discarded as small temporary fluctuations for they indicate long-term trends. We know, however, that it is impossible to reverse these trends overnight since cycles in education are measured in years, sometimes in generations.

Declaration mentioned above proposes several measures required to overcome problems brought about by a decline in interest for computing and related studies. Governmental institutions need to be aware of the situation and act for example by providing scholarships and incentives for investments in education in ICT. Developed should be curricula for ICT that would best suit professionals from fields different than computing and science. The measure we find to be essential is to ensure financial and other conditions necessary in order to attract highly trained and inspiring computing graduates to choose a teaching career.

It is also our and your experience that we exchange at annual conferences on education in the information society (this year's being already 11th) that persistently report on how the development of technologies alone will not bring progress. The momentum is namely caused by people via their daily work as well as by people who keep transferring the findings into practice. However, teachers are the ones who prepare them for their missions. Educational materials and supplies are of course extremely important. Still, it is hardly surprising how one of the top Universities from the USA responded to the bewildered questions regarding the free access they offer to their e-content. They believe people are their main asset and do not expect to suffer any loses due to this decision. Even if a person does become fully acquainted with the complete e-content, they do not automatically achieve the level of education of the institution in question. We welcome new opportunities arising from the development of e-learning and other improvements of the learning process attributed to ICT. At the same time we should not forget that direct contact with the teacher remains indispensable. Not only does a teacher possess knowledge but also inspires students and unlocks their potentials to develop and learn to learn, also due to ICT.

Vladislav Rajkovič,
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Vzgoja in izobraževanje v informacijski družbi

Čeprav živimo v informacijski družbi in zaradi tega močno narašča pomen poklicev in znanj, povezanih z računalništvom ter z informacijskimi in komunikacijskimi tehnologijami, se soočamo tudi z vrsto težav, saj nekateri procesi v družbi temu razvoju ne sledijo dovolj hitro. Celo nasprotno, soočamo se s pojavi, zaradi katerih lahko pričakujemo v prihodnosti še večji razkorak, če ne bo prišlo do pravočasnega in odločnega ukrepanja. Na to jasno opozarja deklaracija mednarodnega strokovnega združenja IFIP (International Federation for Information Processing), sprejeta letos septembra na svetovnem kongresu IFIP v Milanu, ki opozarja na veliko upadanje števila diplomantov računalništva in na premajhno število dijakov, ki v srednji šoli izberejo pouk računalniških predmetov na višji stopnji zahtevnosti. Problem že občutijo zaposlovalci v industriji na področju informacijskih in komunikacijskih tehnologij, seveda pa ni in ne bo brez posledic tudi za šole. Ne gre za manjša trenutna nihanja, pač pa za opažanja, ki kažejo na dolgoročne trende. Teh pa ni možno obrniti čez noč, saj vemo, da se cikli v izobraževanju merijo v letih in včasih celo v generacijah.

Omenjena deklaracija predlaga nekaj ukrepov, potrebnih za preseganje problemov, ki jih prinaša upad zanimanja za računalniške in sorodne študije. Med drugim naj bi zanimanje dodatno spodbujale tudi državne institucije, ki se morajo polno zavedati stanja in ukrepati z mehanizmi, kot je npr. štipendiranje in spodbujanje investicij v izobraževanje za IKT. Razvijati je potrebno učne programe, ki dajo čim boljša znanja IKT tudi drugim, neračunalniškim in netehniškim profilom. Predvsem pa se nam zdi pomemben zadnji izmed predlaganih ukrepov, to je zagotovitev finančnih in drugih pogojev, ki bi pritegnili visoko usposobljene in »navdihujoče« diplomante računalništva, da bi se odločali za delo učitelja.

Tudi naše in vaše izkušnje, ki si jih izmenjavamo na vsakoletnih konferencah o vzgoji in izobraževanju v informacijski družbi (letošnja je že 11.), vztrajno postavljajo v ospredje sporočilo, da sam razvoj tehnologij ne bo prinesel napredka, saj so njegovo osrednje gibalo ljudje, ki ga ustvarjajo s svojim vsakodnevnim delom, in ljudje, ki njihove rezultate vztrajno prenašajo v prakso. Tako ene kot druge pa na njihovo poslanstvo priprav-ljamo učitelji. Učni materiali in pripomočki so seveda izjemno pomembni, a ne čudi, da je ena od najelitnejših ameriških univerz na začudena vprašanja ob sprostitvi dostopa do njihovih e-vsebin prepričljivo odvrnila, da se zaradi tega ne boji kakršnekoli škode, saj so njihova glavna prednost še vedno ljudje. Če tudi nekdo absolvira vse e-vsebine, si s tem še ne pridobi izobrazbe dotične univerze. Pozdravljamo nove možnosti, ki jih prinaša razvoj e-učenja in drugih dopolnitev ter izboljšav učnega procesa, ki jih prinašajo IKT. Hkrati pa ne pozabimo, da neposredni stik z učiteljem, ki ne posreduje le svojega znanja, pač pa tudi navdihuje in iz učencev v kar največji meri izvablja njihove potenciale, da se (tudi ob dostopu do IKT) razvijajo in se učijo učiti, ostaja nepogrešljiv.

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Trends that will Shape the Professions of the Future Information Society

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In this paper we discuss the trends in present society that will have the most important influence in shaping future jobs, with an emphasis on issues related to sustainable development and an information society. We point out that based on the requirements of educated end-users, companies will have to follow the principles of sustainable development and social responsibility. In future, due to technical development, natural resources, environmental issues and demographical trends in the developed western world, the most attractive jobs will be in high technology, health and medical care, as well as the pleasure and free time industry. The most important sectors will be informatics and telecommunication, logistics, safety, healthcare and life-long education.

Keywords: information society, knowledge management, end-user, sustainable development, socially responsible companies, jobs of the future

1   Introduction

In a dynamic, modern society, everything (companies, people, relations, products, environment etc.) is under constant change. Professions also have a life cycle and are constantly evolving and it is interesting to research and recognize the trends that shape them. When thinking about which professions will be needed in the future, one must analyse the forces which influence the emergence or dying out of professions and what the present trends are in the global economy. This is undertaken not only to enable planning for personal professional careers but also for planning educational programmes ensuring a strong basis for upcoming generations to solve problems of the future world.

Throughout human history different professions have been emerging and dying out due to the level of technical knowledge and ownership. In the times of old Egypt celebrating the greatness of Pharaoh and Gods, there was a very important and well appreciated job of a scribe, who had the knowledge to write down the quantities of crops. Even today this profession still exists in countries with low literacy but will surely die out with the introduction of educational programmes. Important changes have occurred in the time of industrial revolution and with the beginning of mass production. The need for new jobs, such as warehousemen and transporters emerged. In the times of rapid development of telecommunications, some jobs, for example a telephone operator, have already been replaced by technical solutions.

As discussed (Clark, 2007) some traditional jobs still remain popular and in need despite constant changes and will never be replaced by new technologies. Such jobs include diamond cutters and jewellers, hair dressers, baby sitters and medical doctors. According to present trends some jobs, including cashiers at shopping malls, film developers, CD sellers and fire fighter pilots, are likely to die out in the near future.

The rapid development of production companies that are based on excessive use of natural resources and not on a rational use of products, lead to immense ecological and developmental problems. The issue of sustainable development is discussed in the paper of the World commission for environment and development (Bruntland, 1987). This paper pointed out that sustainable development is not only a basis for further development but also as the only chance for survival. Among others, the direct connection between economy and the environment is pointed out and that sustainable development means meeting the needs of the present generation without endangering any future generations. As discussed in the paper (Potočan and Mulej, 2007) the UNO in 2002 accepted sustainable development as the best possible basis for operation of all parts of society.

Today the world is extremely complex. It is clear that only partial problem solving, and not considering all aspects, usually leads to even bigger problems. One of the characteristics of the modern world is the immense quantity of accessible but dispersed pieces of information from which it is extremely difficult to create a big picture, but this important to be able to understand the processes

in all their complexity. This is needed when accepting the decisions that will not be soon characterized as partial short-sighted or even completely wrong. (Urbančič et al., 2006; Urbančič 2007). Possibilities offered by computer technology must be used not only for fast access to information but also for their effective analysis and use.

This paper is organized as follows. First, we present and discuss the major trends in modern economy and society that will influence the evolution of professions: from well recognised needs of educated and environmentally aware end-users, through automation, globalisation and informatisation to sustainable development and socially responsible companies. In Section 3 the need for life-long education is discussed, along with prospective industries and the most promising jobs. The most important issues are summarised in the conclusion.

2   Trends in Economy and Society

2.1   Needs of the end-user

All activities of companies are directed towards meeting and satisfying the needs of end-users, offering them products or services. End-users in accordance with their level of awareness as well as their material and social needs, expect products and services that offer greater security, comfort, quality time, use of energy saving devices, access to telecommunications and environmental friendliness.

In the developed economy, the increasing ecological awareness of end-users will increase the pressure on companies to offer more and more sophisticated products and services that will meet the expectations of consumers. In the international economy the war for resources is becoming increasingly obvious and brutal (for example, putting flags in the ocean floor where oil or gas is to be exploited in the future, Greenland, poles) where military forces are used to obtain or protect influence over natural resources. Due to the concentration of capital and therefore influence in the hands of a minority, great differences in society occur and civil groups are taking over the initiative to change processes in society. In the future the feeling of security and commodity will become progressively more important and people will search for safe shelter in the privacy of their own homes. Modern telecommunication technology will be accessible to more people and will enable them to reach all kinds of up-to-date information from their homes. This will also result in a change of working habits, with more people able to work from home. Consequently, the organization and functioning of companies will be influenced. Since people will spend more time at home, good quality catering, cleaning and health care services will be needed.

Modern economy will have to follow these trends and take into account that the products and services most demanded (Robinson, 2006) will be those based on the needs of end-users:

- rational time spending,
- reducing costs,
- ease of use,
- improved safety,
- greater reliability,
- environmental friendliness.

The demands of the educated end-users will be rational and in accordance with sustainable development. Such end-users will still be a minority for a long time, but nevertheless they will have influence through their big spending potential. The large evolving markets of China and Asia will of course initially accept a consuming mentality. In the long term, a consuming society has no chance of survival. The cost of producing enormous quantities of waste will have to be recognised and paid, hopefully before critical degradation of our natural environment.

2.2   Automation, globalisation, informatisation

Three major trends shape and characterise the modern economy: automatisation, globalisation and informatisation.

- automation: introducing high technology production lines reduces the demand for a highly educated labour force in well developed western countries, one of the consequences is also moving old production lines into regions with lower labour costs,
- globalisation: due to multinational companies producing, distributing and offering their products all over the world (aiming also to exploit natural resources worldwide, lower production costs, and increase their profits) the world has really become one through logistic and communication channels. The consequence of moving services (due to English language as lingua franca all kind of services can be offered globally), is as follows,
- informatisation: the above mentioned trends are possible only through the support and extensive use of information and communication technology that enables permanent access to almost any part of the developed world. The internet plays a vital role in connecting individuals all over the world and exchange of information.

Related issues include demography, stage of development of an economy, educational system, ability of transferring knowledge into economy, safety, culture and religion of certain geographical regions. The aging population, technological development, telecommunications, energetic and environmental issues are therefore the most important topics that companies must incorporate in their strategic plans.

2.3   Socially responsible companies and sustainable development

Due to their capital and the influence on society they have through political channels, the multinational companies bare a great part of the responsibility for accepting and following the principles of sustainable development.

Unfortunately nowadays our economies face challenges through the excessive use of natural resources, littering the environment, endangering biotic diversity. Most companies today still think that it is enough to follow the legislation and market rules and do not accept the concept that they must, in addition to the needs of the company, meet the needs of the environment: both natural and social. Nevertheless, there are already companies that have accepted the concept of sustainable development and they understand that they must bare part of the responsibility for the development of society and actively contribute to reaching a common goal.

Research has shown (Kralj, 1999) that there is a direct correlation between the socially responsible behaviour of companies and their success as their better reputation contributes to better business results. The concept of socially responsible companies is very narrowly connected with the concept of sustainable development. Environmental issues must become part of the strategic plan, incorporated in the very heart of a company's value system.

If owners of the capital will not recognise the need to give up part of their extra profits in favour of preserving natural resources and the environment, in more distant future the environmental conditions will become more severe. Radical changes in ecosystems can occur, and regions where the majority of food is produced could be severely damaged. If consensus on the broadest international scale is not reached, the excessive use of natural resources could lead to a struggle for pure physical survival.

3   Educating for the Future

In an extremely fast changing environment the only way to stay competitive, have the chance of being successful and in the most extreme situations, to be able to survive, is to accept the life-long learning concept.

As Bauman points out in the chapter titled Learning to Walk on Quicksand (Bauman, 2005), in a liquid modern setting, for education and learning to be of any use, it must be continuous and indeed life-long. No other kind of education and/or learning is conceivable; the "formation" of selves or personalities is unthinkable in any fashion other than that of an outgoing and perpetually unfinished reformation. Bauman also points out that the consumer is the enemy of the citizen, and stresses that over the "developed" and affluent part of the planet, signs abound of people turning their backs on politics, of growing political apathy and a loss of interest in the running of the political process is becoming more obvious. It is becoming increasingly clear that democratic politics cannot survive for long in the face of citizen's passivity arising from political ignorance and indifference and that citizen's freedoms are not properties acquired once and for all; such properties are not secure once they are locked in private safes. They are planted and rooted in socio-political soil and it needs to be fertilised daily as it will dry out and crumble if not attended to day in, day out by the informed actions of a knowledgeable and committed public. It is not only the technical skills that need to be continually refreshed and not only the job-focused education that needs to be lifelong. The same is required, and with still greater urgency, by education in citizenship. Bauman concludes the discussion with the following thought: "We need lifelong education to give us choice. But we need it even more to salvage the conditions that make choice available and within our power."

For life long-learning, as pointed out by authors (Awad and Ghazir, 2003), the accessibility of information and communication technology is of utmost importance and therefore it will be absolutely necessary for workers in all professions to be able to use it. The educational system must teach people "how to learn", how to generate, seek, use and transfer knowledge.

Regarding the development of the new technologies, demographical trends, safety issues and the demanding and educated end-user, the most promising jobs will be in the following sectors:

- safety and comfort of the home,
- healthy life style,
- care of senior citizens,
- pleasure and free time,
- craftsmanship
- informatics and telecommunication,
- transport and logistics.

Projections (Collste et al., 2006) show that in 2012, in the developed Western World, 7 out of 10 new employments will be in the health and care sector as the baby boom generation reaches their senior stage of life. Those jobs cannot be replaced by technology or automation, but can be greatly supported by information and communication technologies. It is expected that for 8 out of 10 new employments in that time, a level of higher education will be required.

Swiss research institute Prognos has published research analysing those jobs which will be most sought until the year 2020. The following jobs were ranked very highly (after the research of Prognos Institute published in Focus, 2004, www.focus.de/finanzen):

- industrial engineer,
- hospital manager,
- air flight control,
- IT project manager,
- re-insurance specialist,
- auditor,
- legal advisor,
- logistics expert,
- programmer, software developer,
- system administrator,
- aircraft engineer,
- mechanical engineer.

The list of prospective jobs also includes: truck driver, medical nurse, sustainable development consultant, experts for holography, database managers, dental assistants, physiotherapists, personal trainers, home assistants, caterers, and eco-layers.

Some analyses attempt to foresee the development of entirely new professions based on new technologies, environmental demands and demographic trends. Forbes magazine discusses the following new jobs as something becoming very normal in the future:

- quarantine specialist,
- specialist for managing submerged cities and coastal areas,
- mechanic for home robots,
- animal sitter,
- space excursions guide,
- manager of hydrogen power stations.

4 Conclusion

As the research has shown (Potočan and Mulej, 2007) companies need radical change and innovative management style, including the ethics and actions of all participants to accept and follow the principles of sustainable development. The companies will have to find a new balance between their own interests and the interests of the community.

Sustainable development should be studied, researched and taught at universities and research institutions. Answers to open questions should be found and transferred into the economy. Universities and researchers can contribute by publishing findings, influencing the new generations of managers who will understand the importance of the principles of sustainable development and incorporate them in everyday activities of the economy.

It is important for long term quality that these principles are accepted worldwide and incorporated in global values. A very important role is played by the education institutions at all levels, and researchers who create new knowledge should not forget the importance of information and communication technology in the process of creating and spreading new knowledge.

Therefore, it is of utmost importance that experts of all professions are educated to develop, use and spread knowledge into all pores of society. Besides the knowledge, a crucial role in the future will be played by personal engagement, focus and commitment of professionals.

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Trendi, ki bodo oblikovali poklice v informacijski družbi prihodnosti

V članku obravnavamo trende, ki imajo v sodobni družbi najpomembnejši vpliv na razvoj poklicev v prihodnosti, s poudarkom na vsebinah, povezanih s trajnostnim razvojem in informacijsko družbo. Ugotavljamo, da bodo zaradi zahtev osveščenih končnih uporabnikov podjetja pri svojem poslovanju prisiljena upoštevati načela trajnostnega razvoja in družbene odgovornosti, v prihodnosti pa bodo zaradi napredka tehnologije, usihanja razpoložljivih naravnih virov, okoljskih zahtev in demografskih trendov v razvitem zahodnem svetu, najbolj iskani poklici v visoki tehnologiji, negi in zdravstvu ter zabavni industriji. Pomembni sektorji v gospodarstvu pa bodo informatika in telekomunikacije, logistika, varnost in udobje, zdravstvo in izobraževanje.

Ključne besede: informacijska družba, upravljanje z znanjem, končni uporabnik, trajnostni razvoj, družbeno odgovorna podjetja, poklici prihodnosti

E-education between Pedagogical and Didactic Theory and Practice

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Education systems confront new requirements to become more efficient and contribute more to the economic success of society. At the same time there are new challenges for the education systems to perform their tasks using advanced technology. In capacity, information technology considerably surpasses the current learning technology. Supported by Internet it creates an electronic parallel to the standard school and learning. Unfortunately there is only sporadic evidence that supported by information technology, learning and education system as a whole can be considerably improved. In spite of that, we believe there is no way back and e-education is not just a temporary whim. Even though we do not know exactly who should perform what and to which scope. The passiveness of pedagogues, the lack of empirical research and the occurring expansion of the market for e-education products without their quality assessment is not of advantage to this progress. The spread of e-education production without considering the professional opinion of pedagogues, who beside their practical work must also engage in developing their own pedagogical theory, might not benefit the existing education achievements. On the other hand, didactics can by analogy be applied also in the web environment, consequently creating the related assessment mechanisms of the electronic education elements.

Keywords: Didactics, e-education, informatization, IT, information technology, multimedia, interactivity, knowledge quality

1   Introduction

The schools in Slovenia seem to be at a turning point, where they have to face greater expectations, created by the economic and technological progress, which require certain modifications and adjustments, as well as answers in the area of education technology support and, above all, in the field of information technology (hereinafter IT). I was stimulated by a statement made by a representative of a Slovenian branch of a foreign programming company, a pure technician, as he described himself, who pointed out that insufficient cooperation with pedagogues is the main cause of the currently poor Slovenian e-education production. On the other hand however, e.g. among principals, we can hear that it is enough to have a computer programmer set up an e-environment for the school. If the programmer does not know how to complete this assignment, s/he should look it up on the internet to see how the others have solved this problem. Some schools turn the problem of IT implementation over to the computer science teacher. In the last few years, rather substantial resources were intended for the e-materials. However, the above-mentioned programming company has concluded, on the basis of close monitoring of the development in this field, that e-materials are not used much, which means that the teachers have not been convinced of their benefits. Professional errors can also be detected, as well as incorrect assumptions regarding e-education, which point out poor knowledge of some educationalists.

Further on I would like to present questions regarding school, education and virtual environment learning, which can be answered mainly by pedagogy and didactics. When requiring answers from these two professional fields, we have to interrogate whether the IT implementation modifies and complements them and thus influences the theory. We should encourage integration of pedagogy in e-education, as well as its empirical research.

Many questions were raised by educationalists in various seminars and surveys and they require answers. Lack of information diminishes their motivation for technical and technological upgrade in schools, which reduces progress of schools and consequently of society.

2   Retrospective

According to some researchers, e.g. dr. Kornhauser, the beginning of the e-education theory goes back to the 1950s, when computers came into use. However, some researchers claim that its beginnings go way back to the antique era, since they had already used questions in order to guide a student during the learning process. They were familiar with organization of material into cognitive units, so that the students progress step by step. Some elements important for e-education were introduced in

the Middle Ages, when an individual teacher was making sure that the student was active. Later on, Komenski was encouraging teachers to teach less and let the students learn on their own, and Pestalozzi claimed that teachers should only give students a starting point on the path to knowledge, which the students should later seek on their own. The movements occurring later were criticizing the inefficient school system and attempted to build a new one, based on the individualization of lessons, autonomy of teachers and schools, self-learning, flexible approach to the teaching content and its real-life aspect.

In programmed lessons, under the influence of cyber pedagogues, automated learning and learning process management was developed, as well as the automated information transfer and feedback. Cybernetic approach, insufficient participation of pedagogues and lack of research, in addition to rapid introduction of computer programmed lessons in 1960s, due to the sudden great enthusiasm, led to the loss of significance of such learning. However, it provided useful information for e-learning. Besides certain technical questions of learning, the learning principle of activity, responsibility transfer of the student's success and autonomous search for knowledge, remained on the riddle of history. Other important aspects include the experience on how to train a student to develop self-learning skills, lesson individualization and the importance of flexibility of the teaching content. However, the disadvantages of the technically-based programmed lessons and other mistakes from the past should not be repeated in e-learning today.

3   Whose task is e-education?

Educational cybernetics, which implemented educational technicism, was criticised. It is important to point out the opinion of Gerlič (2000) and other domestic and foreign experts, namely that e-education is primarily a pedagogical or a didactic problem, which means that it cannot be solved only by informatics and computer science, without participation of pedagogic field. The answer to the question whether the educational IT is pedagogically neutral is also negative. The development of e-education requires pedagogical theory as well as practical knowledge about the educational process, which the teachers manage to gain through practice.

Nowadays Slovenia still lacks the systematic approach to implementation of e-education. The viewpoints of teachers on this subject differ, which leads to various levels of their involvement. Some of them show interest, while others tend to withdraw from this process and leave it to others (Rebolj, 2007). In spite of the above-mentioned crucial role of didactics, cooperation with the information scientists is required, in order to establish proper conditions for e-education implementation. Teachers need to get professional support from pedagogues (theorists) and participate in establishing the conditions, planning, implementation and evaluation of e-education, which requires additional knowledge. According to the data from some European countries, the programmes in which the teach-

ers acquire the so called e-competence, apart from the practical skills also include pedagogical theory, which is a result of development of pedagogical thought, due to the IT implementation.

Principals and teachers have to be capable of designing the needs of schools and have to assess whether the presented technology is adequate from the pedagogical point of view. The emergent market offers e-materials, syllabi, didactic aids and various services, e.g. for preparation of virtual schools, portals and learning environment. If we do not decide to purchase an open source platform, there are other options, e.g. learning or content management system, authoring tools, school organization software, cooperative learning system, or project work system. As the supply on the market is growing rapidly, it is necessary to 'sift the wheat from the chaff' (Rebolj 2008a).

Educationalists have to spend money reasonably, which means that they need to know what they purchase and what they would still need in the future. What is good and what will be useless for the school. Recognition of the dark sides of IT is also very important and can present a problem for the non-experts, who are drawn to the attractive technology.

IT implementation in education is a theoretical problem as well as a problem of empirical research in pedagogy and didactics. Even in the countries with a great deal of experience in this field, the empirical foundation is rather weak. The reason for this may be their excessive confidence in the positive outcome of IT implementation in schools and their belief in its necessity, in order to provide computer literacy for the students, although its contribution to the knowledge and learning might not bring the expected results.

4   What do we want?

The role of a computer in learning, revision, testing, grading and personality development processes may vary (Colin 1992). These processes can be:

- computer assisted,
- computed, i.e. based primarily on computer support,
- classical, with some computer aid,
- computer managed,
- web based and accessed by computers (internet).

A combination of the listed options is also possible in the above-mentioned processes. Populistically speaking, the goal of the current use of computers is to form an efficient information society, which requires efficient individuals that are able to learn, work and create with computers. This is important for an individual's career, the basis of which is formed in the early youth and can offer a relatively stable foundation for life. This basis presents an important starting point for the development of an individual's career, which is marked by two dimensions: a career in the view of an employer and a career in the view of each individual. One of the reasons for IT implementation in schools is to develop the students' career-building capabilities and to establish the possibilities for career development.

We need a successful society and for that the need of a greater learning efficiency and greater quality of knowledge has increased. Efficient learning leads to a greater quality of knowledge, obtained with less effort (Conner, 2006). The end of the process therefore results in greater competence of a student, without the wasted effort in the learning process. Psychological conditions can improve substantially, as the students are constantly aware of what they have already learned and what they are still to learn. The exhausting drill can be replaced by far more pleasant activities.

Quality of knowledge can be achieved by the constantly updated contents, offering adequate cognitive load (Mittal, 2007), pleasant learning atmosphere and measures that have a positive impact on memory.

The attempts of trying to teach students ''everything'' have stopped. The school does not try to select the ''right'' knowledge from the endless collection of human knowledge and pass it on to the students; not to the extent it used to in the past, that is. The students have to be trained and have to obtain proper skills in order to be able to find the necessary information and knowledge when they need it. That requires proper organization on the part of a student, taking on responsibility, maintaining critical distance to oneself and adopting the ''learning to learn'' techniques. The learning process can thus be described as a two-track system, i.e. following the learning goals and socializing students.

5　IT and pedagogical thought

Neither pedagogical theory nor practice can bypass IT. In the light of experience gained so far, introduction of computers in lessons has broadened the understanding of education and has supplemented the existing didactics. Classical formulas regarding the education cannot offer solutions for every aspect brought by the e-education, especially since the web is in use.

Pedagogical theory arises from practice. First level of practice generalization creates learning principles and the second creates pedagogical theory. Does IT cause changes in practice? The answer to this question is definitely 'yes'. The students study independently, through forums, web-pages, e-mail, hyperlinks, and blogs, which are absent in the classic educational practice. Such practice introduces novelties in learning principles and the importance of some principles, e.g. learning principle of activity, is increased. All this has an impact on the pedagogical theory, which can be created through pedagogical research and involvement of the pedagogical experts.

Although teachers are very important in this process, their pedagogical potentials cannot be fully counted on. The time of pedagogical recipes has passed. Pedagogical theory has to make enough sense in practice. Nevertheless, the theory cannot offer solutions to all the problems and cannot answer all the questions that arise in practice.

Some expectations regarding e-learning/teaching are too high. We cannot expect that IT would eliminate problems piling up at school or that we could simply transfer the responsibility for success from teachers to students. Theory can inform practitioners and can guide them when transforming the practice. However, to solve the actual problems, it is necessary to organize systematic and regular discourses, which shall display criticism towards theory as well as practice.

E-education implementation will probably be a slow process but this shall prevent its downfall, after which a substantial amount of time would be needed for the education to rise again. Individual examples of success cannot be the only indicator of improvement in the quality of knowledge and in the quality of students' life in schools, as well as individual examples of bad experiences should not be used as a tool against technological modernisation of schools.

5.1　Cans and can'ts of IT?

''If you have a problem, try to solve it in classic environment first, only then try to use IT, because technology is not almighty and you are less familiar with its environment,'' wrote Hannafin.

The belief of the greatest optimists, namely that computers and internet will solve all the problems in schools, is wrong. The fact is that IT can not simplify the complexity of modern life and this fact hinders the selection of teaching contents and setting of teaching aims.

Among our educators we can hear underestimating or overestimating statements regarding IT. The underestimators are sure that it is just a fashion fling and that it is only a matter of time before it comes to an end, just like all the unsuccessful school reforms. The overestimators on the other hand believe that IT will offer many solutions to the problems occurring in lessons, which cannot be solved in classic environment. Excessive expectations are not justified, although some foreign researches have shown that classic learning environment can be limiting, considering the current criteria. E-environment or IT support can increase students' motivation, offer a lot more information, extend the attention span, improve comprehension and make lessons more interesting, which are the all direct effects. However, there are also indirect benefits, such as obtaining computer literacy and influencing one's personality (autonomy, self-confidence, ingenuity and learning flexibility).

One of more significant problems that can arise with unprofessional IT implementation is decrease in the students' level of knowledge. In some schools, the desire to maintain a faster, less strenuous and less expensive learning process, has already resulted in superficial knowledge. The content and tasks are less demanding and the lessons are not sufficiently problem-oriented. Post-secondary education level lacks the experience exchange among students and practical dimensions of knowledge, due to the reduced practice, which is a base of professional programmes. Current technological and didactic levels already enable high-quality of practice implementation in web environment.

Even though the result-oriented learning has been reduced due to some changes and measures in the school system, the latter is still predominantly performance-oriented. The results of learning are usually displayed in numbers, which evaluate not only students but also their teachers. Consequently the teachers do not like to leave the 'beaten and safe' educational tracks in schools and do not want rapid changes.

5.2　Changes in pedagogical practice

Changes influenced by IT should be introduced thoughtfully and gradually. Overall preparations are especially important, far more than with the classic form of teaching, because a part of professional energy is transferred from the implementing to the preparatory stage. Theoretical knowledge on the introduction of changes in organizations can be usefully employed here. Thoughtlessness or superficiality can annul the significance of some previous achievements of the school. It shall not be satisfactory if the results are neutral or barely visible, as that would make IT a bad investment. It is important to provide a significant improvement. The questions of what is up-to date and what is outdated and conservative in schools are usually asked by parents, who want their children to be burdened less, when it comes to school. At a Parent's Council meeting at one of the nine-year primary schools one of the criticisms was that the 1st grade pupils are being ''tortured'' with handwriting and that in higher grades the pupils are expected to present legible and aesthetic handwriting when graded. The parents claimed that handwriting is no longer used today and even some of the teachers agreed with this statement. Of course, they were wrong. Handwriting is an excellent method of coordination training for eyes and hands, and later the children will also need manual skills and the sense of aesthetics. Once, dr. Bečaj responded to such complaints, ''It is true that the teachers' solutions to some problems tend to be less appropriate but what will happen if we take this option away?''

Caught in routine, we sometimes disregard the significance of the individual school activities, which will have to be examined more often in the process of their inclusion into e-environment (Reynolds, 2006). E-environment for biology, for example, includes an introduction of a microscope. It took the programmer a week to make a simulation to increase the preparation focus by turning the button on the microscope. Nevertheless, an actual microscope has to be used in practice, since a computer simulation cannot replace it. We could call this a pedagogical error and useless waste of time and money.

One of the major practical problems derives from the concept of combined (blended) learning, where cognitive bridges have to be built between the classic and the web stages (Rebolj, 2005). Analogy with classic environment usually works in web environment, however this is not always the case.

Sometimes the models tested in a classic environment can be reformed into web-environment models, somewhat theoretically and somewhat analogically. Experience in e-material preparation workshops have shown that the best initial way to do it is to reform classic material into web material, preserving the linear structure and the sequence of learning steps. The very first hours of the workshop witnessed a rather slow progress, which later became faster and more dynamic. The teachers were able to identify themselves with the students learning autonomously on the web and the progress became significantly faster. The next e-material was thus based on principles and possibilities offered by the web. In addition, characteristics of the students were considered as well.

The transfer of learning from the classic to e-environment has to be implemented with a critical approach. We have to carefully consider what can and what cannot be transferred and we have to take advantage of the endless new didactic possibilities.

School as a wider e-environment and as an environment for the students has to be well-arranged and organized. In the past, schools were buying different programmes, which are being used to various extends but usually have the role of rather lonesome and unrelated informatization islands (Ferran, 2006). School environment, as well as learning environment, should only have one access. In addition to material, a learning environment also requires web working tools, access to the sources of knowledge and possibilities of various forms of cooperation - all that is necessary but nothing superfluous. The question is, whether it is sensible, from the pedagogical point of you, to separate e-material from the environment, since learning, which requires sources of knowledge, practice in other environments, and group work, is in question.

5.2.1　Excess of classical teaching practice: multimedia and interactivity

Transmitters of information in a classroom with a blackboard and a chalk are only the texts and signs on the blackboard. Historically speaking, school lessons were first enriched by pictures and later on by sound recordings, overlays and films, and in the episcope era, it was possible to discuss the pictures from the books using the frontal teaching methodology. Transmittal of information via various media was named multimedia. Didactic use of multimedia has been treated theoretically but in a web environment its possibilities are increasing.

We can speak of interactivity if a student gets an intelligent answer to a challenge. The relation between them should be reciprocal, which means that the transmitter receives a response, which has an effect upon it. Although we can speak of interactivity in a classic learning environment, it only reaches its true dimension in a web environment.

Multimedia and interactivity are expensive. However, we have to bear in mind that the didactic results are so great that they compensate for the time and money spent on preparation of a certain element of teaching

material. In secondary-level e-materials for mathematics, prepared for one of the EU funds tender, the author (a math teacher) added dancing sinusoids at the beginning, accompanied with loud music, which the young like to listen. However, the multimediality in the teaching content was rather modest. The students commented that the music was disturbing and deconcentrating, which points to a programmatically perfect but pedagogically poor product.

The quality of information does not depend much on the technical perfection of an element if its technical characteristics otherwise enable unambiguous reception. It is true, however, that the media impact makes the students technically ''spoiled'', which means that they are turned off by the technically primitive or archaic elements. Consequences of technical weakness can be mitigated by thoughtful and original solutions. Another important fact that needs to be considered is also the appropriateness of elements for presentation of certain information and to what extent it activates students. It would be wrong to thing that every multimedia element is good and that a greater quantity of elements consequently leads to a better knowledge. Some materials contain too many elements. Confusion is increased by illogical distribution and deconcentration is caused by the excess colours and details, which are not related to the actual contents. Several researchers point out that the results of e-material learning are good only if the multimedia elements are mutually supporting and if they are consistent with the contents. Considering the learning objectives, the elements should be clear, 'ballast-free', i.e. free of irrelevant contents which lack a didactic value.

The use of multimedia can be related either to the study contents or to the learning goals. Students become familiar with the study contents in an easier and more pleasant manner, which also applies to its understanding and use. It is important that the multimedia creates shortcuts to knowledge or optimal paths leading to the learning objectives. The selection of multimedia elements has to be careful, with proper quantity and suitable placement in the text (Whalley, 2002). One element is sometimes enough for one information, Sometimes one element is enough to present one information, except when we want to present something multilaterally. Multimedia can increase the level of information memory, e.g. if a student receives information via several elements – reading, graphic presentation, listening – the probability of remembering the information will increase.

5.3 Important goal: the quality of education

The notion of quality is rather complex and can be agreed upon on the national or organizational level, e.g. school (Požarnik, 2004). The actual quality is therefore based on the agreed quality concept, which includes the view of the quality depending on the environment and on the process monitored by the participants. Schools usually adjust the models every school year, which can present a challenge towards reaching greater demands, connecting the quality

and the vision of the school. IT does not guarantee quality by its mere existence. Only its pedagogical use and exploitation can provide it.

5.3.1 Student's reflection

An important component of the current quality concept is students' satisfaction, which is determined through the students' reflection of the process they have been subject to. This is usually the relation between their expectations and the gained. It is not about the evaluation of e-materials or teachers on the part of the students. The students express their feelings regarding the use of technology, related to the navigation logic, the amount of the energy used for the technical work during the learning, the portal regulation, and the aesthetics of the learning environment. Even more important are the feelings related to the process of becoming familiar with the contents and the learning atmosphere (Rebolj, 2008b).

5.3.2 Higher levels of knowledge

Recently, we have read some warnings coming from didactitians, namely that e-education implementation could lead to lower levels of knowledge. The reason for scepticism is the emergence of the so called e-education on the education market. However, this is only the name they use, not the real thing and this can be a consequence of a low level of professionalism or merely a desire to make a profit. The abolishment of classic lessons in schools may lead to lower expenses regarding teachers and education area. Poor or partially prepared teaching can sometimes turn into learning summaries of summaries or can be so shallow that the students fail in every practical task.

Various levels of education mean different students, as far as their cognitive abilities are concerned, and different learning objectives. Taxonomies, e.g. Bloom's taxonomy, are helpful in learning objective classification. Higher levels of knowledge, which enable finding and solving problems, as well as result evaluation, can be reached in the early childhood and later on during all levels of education, not only in higher education. It is true though that without the previously-mentioned level, degrees should not be granted. The highest levels of knowledge are not intended only for individuals with great abilities. New pedagogical dimensions arising from e-learning/teaching enable us to reach higher levels than in a classic classroom with the same possibilities.

This thought leads us back to the question what e-learning/teaching or web-based education actually is. Of course the conditions for the latter are not established by merely offering lecture notes or a textbook on the web, replacing the printed form. If we allow the students' absence from practice, if we do not organize exercises on the web or if we prepare e-material, which can be studied in a few hours, we have not accomplished much. However, with the absence of legal basis for e-education implementation, it is difficult to provide adequate levels

of knowledge by merely presenting pedagogic arguments and appeals to the teachers. Schools do not offer enough time for duplication of the teaching process, which means that the same contents would be taught again in the classic manner if the results of the web-based learning are not satisfactory. Normative regulation is necessary for a high-quality e-education. The highest levels of knowledge are provided by special activities organized on the web, which require advanced IT and suitable environment support, such as well-organized forums or special tools, e.g. for project work or web conference. Efficient web based learning, which leads to high levels of knowledge, requires a great deal of pedagogical and technical preparation (Rebolj, 2006).

The complexity of preparation is increased if competences are also being developed during the learning process. This calls for practical work, exercises, experiments, as well as contacts with the actual working and living environment.

5.3.3   Case studies and problem-based learning on the web

Expert meetings abroad have presented many innovative solutions for case studies and problem-based learning on the web and we can really believe that their contribution to the quality of knowledge is great (Lajh, 2005). Scientific evidence has not been presented so far. However, by observing the students, we established that such approach to learning stimulates their thinking and increases their enthusiasm towards learning (Liberatti, 2004).

Problem-based learning on the web is based on the analogy with the classic learning form but the span of the captured information can be much wider (Ko, 2004). Selection and understanding of information, their contextualization and conversion into new knowledge require various learning situations. These are either partial or comprehensive, added by the teachers alone or in cooperation with the students. We can create a problem-based atmosphere in which it becomes a habit to approach new information or tasks in this manner. The students learn through applications, search, by giving arguments and adopting positions, and all these processes make them very active and creative.

Computer-supported problem-based discussions can also be conducted with the illiterate six-year olds. We prepare image-based exercises demanding a problem-based approach and read the instructions to them. Cognitive development of students is of great importance, therefore we have to make the best out of all the options available.

Case study, as a learning form, offers abundant opportunities and reaches higher levels of learning objectives. With a problem-based approach students search for solutions on their own but with a case study students deal and process a given problem. Otmar Lajf ensures us that this form of learning is indispensible in tertiary education, i.e. we cannot speak of a suitable educational process if we

neglect it. It can be successfully implemented from as early as the first grade of primary school.

5.3.4   Instead of conclusion: Establishing quality

The conditions for the establishment of quality in e-school are similar to all other kinds of school: suitably supported learning conditions, unbureaucratic culture, non-autocratic school management and trust among all the participants. If these conditions are absent, we have to establish them. This can reach into the very foundations of a school. In practice a frequent question will be whether it is sensible to invest into technology if we do not have the necessary foundation and wouldn't it be better to wait for the mature conditions for establishment of the basic conditions. What is more important and urgent – IT implementation in schools or its quality? From the pedagogic aspect we have to say quality, however we would like both to happen at once.

If we do not cooperate with teachers, we shall not reach a higher level of knowledge on the web. The way leading to e-learning/teaching seems to be very long but it can be shortened. Systematic approach, without any sideways, can lead to fast consecutive steps, which has been proven in a few Slovenian examples of integrated IT implementation in schools. However, the linear path required theoretical as well as pedagogical and didactic knowledge.

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E-izobraževanje med pedagoško-didaktično teorijo in prakso

Pred šolo so nove zahteve, da postane bolj učinkovita in s tem več prispeva k ekonomskemu uspehu družbe. Hkrati pa šola dobiva ponudbo, naj svoje naloge opravlja z naprednejšo tehnologijo. Informacijska tehnologija v zmogljivostih močno presega dosedanjo učno tehnologijo. Z internetom, ustvarja elektronsko vzporednico klasični šoli in klasičnemu učenju. Obstajajo, žal šele posamezni dokazi, da lahko s podporo IT, to je z e-izobraževanjem izrazito izboljšamo učenje in tudi šolo v celoti. Verjamemo lahko, da ni poti nazaj in da ne gre za modno muho. Vendar pa ne vemo natanko, kdo naj se tega loti in kako ter za koliko. Zadržanost pedagogov, pomanjkanje empiričnega raziskovanja in krati nastajanje trga proizvodov za e-izobraževanje brez ocene kakovosti, temu razvoju ni v prid. Prodor e-produkcije brez oči, ušes in mnenj pedagogov, ki morajo razen za prakso poskrbeti tudi za napredek lastne teorije, lahko dosedanjim izobraževalnim dosežkom škodujejo. Didaktika lahko po analogiji marsikaj izvede in ovrednoti tudi v spletnem okolju, razen tega pa vzpostavi ustrezne mehanizme za vrednotenje elektronskih in virtualnih elementov izobraževanja.
Predvsem spodbudi k iskanju prave poti in uravnavi vijugavih poti do kakovosti e-izobraževanju in boljšega znanja je namenjen ta prispevek.

Ključne besede: didaktika, e-izobraževanje, informatizacija, IT, informacijska tehnologija, multimedija, interaktivnost, kakovost znanja

Children and Virtual Reality – Some dilemas of Education

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Possible responses to the extremely complex and delicate question of the influence that «virtual reality» exercises on the development of a child as a unique personality, on the child's psycho-social development and on the education of a child generally may be provided by serious research of a cohort sequential design, either in research programmes in the field of educational sciences or of other social disciplines. The present paper confronts some dilemmas of the modern world. Particularly those between the «traditional» educational values, «obsolete» families and schools and «progressive» education supplied (imposed) by virtual reality that promotes the social standardization of behaviour and the perception of values and of the world around us. The aggressiveness of the mass media in presenting «virtual reality» as « progressive» and without an «alternative» often results in a virtual life for a child, with virtual friends, education and even virtual families. In the time of developing technology, an important question arises: how to deal with such a situation. Do we direct young people to carefully select from what modern virtual reality has to offer and how do we do that?

Key words: virtual reality, education, values, environment, children, family, school

1 Introduction

Thanks to new technology, the limits of progress are pushed back and the contemporary world is definitely not the same as that of one decade ago. Thanks to scientific achievements and the development of technology, the public has been presented with a few revolutionary scientific discoveries – the genetic map of human being; in astronomy, three new planets were discovered outside our solar system; in Northern Ireland, a shell was found that, based on top scientific research, is estimated to be the oldest living creature on the Earth; the brightest explosion of a star so far was photographed; 700 new species have been discovered in various places on the Earth and in the oceans (while of course a number of species have also become extinct); and all this only in the course of 2007. Among the most significant scientific discoveries of the past year was the discovery of kryptonite in Serbia, a mineral that, according to scientists, is allegedly of the same composition as the mineral from the Superman cartoon (Zloković and Dečman Dobrnjič, 2008).

We live in a constantly changing world and, as a result of this, the life of children, young people and adults follow these changes, which are reflected in different levels of functioning, mutual relationships and communications. New technologies become «new tools», which may promote our knowledge or generally improve our lives if we can master them as not only a formal technical and communicational literacy (Karli, 2008).

2 Generation Y

Alongside virtual communication and/or «friendships», the current generations of children and adolescents will prefer to travel in «virtual reality» to imaginary worlds of jungle or the seashores of Tahiti and Hawaii, to pay a visit to Taiwan or participate in safari adventures instead of wasting their time with their «real» parents, families, peers or reading «dusty» and «obsolete» books for days or weeks. Some children claim that virtual reality brings about more excitement and satisfaction than real life. Instead of direct contact, more and more children will spend their time (free or otherwise) chatting with «friends» on the net, «changing costumes» on media stars and even «taking care» of pets. Virtual dolls have even overshadowed the popularity of Barbie (though this is not true for the millions of children that are dying of famine or diseases in this world). Among the many who are enraptured by this virtual reality is nine year old P. Montemayer (Texas), who thinks that the virtual Barbie doll is indispensable: «If you want to change her clothes that will cost money. On Internet, it is free» (Černetič et al., 2007). It seems that it is no longer a sporadic event that children like more than anything to spend their time in

interactive socializing using the computer. The company Gartner Research created virtual pages that are presently visited by 20 million of users and the growth is highest among the youngest. Beside Cartoon Doll Emporium, the most popular pages for children today are Club Penguin, Cyworld, Habbo Hotel, Webkinz, WeeWorld and Stardoll. Children are offered innumerable interactive games and chatting opportunities as an imperative form of communication. And, while psychologists claim that interactive games cause social and emotional alienation, the young experience them as a unique form of socializing. More than 3000 people from the Western Balkans participate in the millions of interactive games available at the moment.

Communicating with people of different ages and attitudes, they attempt to solve some strategic tasks. Many children play these games night and day while their parents often ignore the situation or claim that they are a «normal» phenomenon of modern life, which they themselves are not ready for or do not know how to respond to. The virtual worlds are a «promised land« for various groups of people and their objectives or professions (Giddens, 1990).

Thus, in the virtual game Second Life, the economists may monitor the behaviour of the consumers, the changes in the foreign exchange market and the efficiency of the free market. In a virtual economy, real money is also a subject of trading and the virtual currency of the Linden dollar can be swapped for US dollars. Since millions of dollars may be earned in this way, it is obvious that the main «player» is the author of the game. The market for virtual property is difficult to estimate. It is believed that in the course of just one year, it reached the figure of 1.5 billion dollars. The system of the virtual economy is developed in such way that you may well buy a house with a swimming pool, a luxury yacht or a small tropical island even when you, the buyer, have no money. But virtual users will be sold virtual real estate with which they may do what they want, but which cost a significant amount of money. There is even tax to be paid on this real estate, which is collected by the taxation authority – the ruler of this virtual world Linden Lab. The company Linden Lab from San Francisco created the Internet game Second Life, in which the tens of thousands of players find various excitements. Children and adolescents, as well as the «generation y», who are exposed to the opportunities inherent in the wide use of micro computers and who daily absorb «vast» amount of information in various ways, are offered and even forced into the virtual world, «which has become an inevitable part of their daily life». Many will wake up to it in the morning and will even not go to sleep (Prensky, 2005).

It is estimated that, in Croatia alone, there are between 600,000 and 700,000 people, of whom many are as young as twelve, for whom e-mail, SMS, instant messaging, chat, skype, facebook, playstation, etc. is considered obsolete. The present generations of children will prefer to socialize in a virtual world rather than in the real world. After the simple web services that aim at internet communication and socialization, new generations of internet services are developing the so called «social networks». Facebook is one of the latest internet phenomena. In the USA and Canada, this popular web page for virtual socializing is visited by 73 million registered users. The number is increasing by 200,000 daily. The informatics newspaper Bug says that more than 50 thousand Internet users from Croatia regularly visit Facebook (Černetič et al., 2007).

What makes Facebook so special in comparison with other similar internet services for socializing (MySpace, Flickr, hi5, blog-services) is that it stimulates communication/socializing between people who know each other already. Since 2004 – i.e. since the registration of this web service – the number of registered users aged 13 years and more increased from 13 million to 60 million. The users of these services claim that the number of new «friends» has been increasing at lightning speed. One user says that, for the first week after he had created his profile, he only had three friends. But in the next few days the list grew to 50 people (!) and, after that, invitations just kept pouring in (Tomić-Koludrović, 2001). Not wishing to enter into an otherwise inevitable broader analysis from the aspect of different professions, it is obvious that the term «friendship» requires relativisation by the user of this Internet service.

3   The Borders Between the Virtual and the Real World

There are different opinions and attitudes towards the development trends of technology. All those who think that the technological and virtual world is a key to the development of an individual and of the society will readily find excuses to present to the critics of «the world of ever-growing technology», who speak of alienation, behavioural disturbances, aggressiveness and some other negative consequences of this «new world». They produce arguments about the numerous benefits that modern (information) technology allegedly offers. These arguments claim that, in spite of the criticism, it enables two way communication, different ways of acquiring information and it promotes the development of pace and the active involvement of children and adolescents in different stimulating developmental contents and activities. The weaknesses of the obsolete mono-tasking and the advantages of the multitasking generation, and also of the traditional linear and modern successive learning, will be compared as and how the obsolete/old and new skills of learning with icons–ability of intuitive learning are compared as the ones that are indispensable to enter the world of the omnipotent market and to fulfil the requirements of modern life.

The fascination with virtual reality and its oddities, which really borders on real life, is illustrated by the example of «virtual fishing» («Fishing with a Rod and Classic Hook» Ippon Zuri). Tens of thousands of Japanese catch and collect virtual prey on the display of their mobile phone and this prey may be exchanged

for real ones. Depending on your success, the virtual prey, transformed into real fish, will be delivered to your doorstep. The Japanese economists are even considering the possibility of defining this catching and trading of «digital» fish as a new real profession. A question arises in connection with this: should the government maintain official records on persons who are employees in a virtual reality world? One of the experts, University professor of law Wharton d. Hunter, is convinced that work in virtual reality deserves the title of a real profession. And some people think that we must accept that the virtual world and real world are increasingly intertwined (Reilly 2007 in Zloković 2007).

With the growth of various aspects of individual and social development, the opinions are stated that the human brain works like a computer and that it can be connected to it, which resembles the plot of the movie The Matrix. There, people of future are apparently asleep in their dens while they actually (virtually) lead «normal», even «turbulent» lives, merely while connected to a central computer.

4　Criticism of Inter-Human Alienation

We do not belong among the defendants of the thesis of «determined chaos» and /or of collusive activities. Moreover, we do not even mention them in this paper but we wish to indicate many cases of the manipulation of children in society and in families. We aim to indicate certain situations in which young people are prevented from deciding or are not stimulated to decide for themselves and in accordance with their interests about their future. Along with the numerous advantages of the technological and virtual world, there are many questions still to be answered – e.g. why morals or ethics are pushed to margin or lost in pursuit of profit and why we often ignore the fact that virtual reality (and various forms of escaping from the «real life»), where children spend an important part of their development period, is attempted to be shown as indisputable, contemporary and «progressive» education.

The results of several studies are quoted as an attempt to reply to criticism of inter-human alienation due to these «new communication technologies». Thus, in the study «Technology Unites not Divides Families», more than 4,500 families from 16 countries in Europe, Asia, America and Australia who have access to Internet were interviewed. The interviewees were asked how much time they spent together, what kitchen gadgets they own and use and similar questions. The authors' conclusion was simple - the information era leads to a revival of the family and its importance as well as of the importance of inter-generation relationships (Reilly 2007, n Zloković, 2007) questioned the validity of the results of the study, considering the fact that there was no reference (control) group interviewed. The conclusion of a greater cohesion in «Internet Families» is considered premature as multi-disciplinary and extensive research is necessary for the objectivity and validity of a study (ibidem). In spite of

that, the results of the study show how many families with internet access and mobile technology use these possibilities to strengthen family bonds. 70% of the interviewees responded that the technology helps to maintain contact with family and more than half of the interviewed young people (aged between 18 and 34) claim that this is not just a help but a necessity.

Also, according to some other studies, the importance of accepting the development of technology and general competences (efficiency, achievements, training etc.), as well as of generic competences (analysis, synthesis, communication, solving problems, teamwork, creating ideas, etc), is obvious for all generations, not just for the young. This is especially true in the context of life long learning. Among others, these competences should be a foundation for positioning in the labour market, to get employment in a modern society, for work in an international environment and for being prepared for teamwork and to process a great deal of information.

The fact is that many unemployed people today are «pushed to the social margin». These are persons of various ages and are precisely those who have not mastered the virtual world. Openness for the modern, the new and the better is indispensably important but the adults who are in daily contact with children, parents, teachers and other people who are expected to carry out educational functions need to be taught and respectively reminded of their educational and moral duties to children and young people. These people however need to be daily stimulated to critically refer to and to carefully consider what is offered by the ever changing world – what they are told, what is expected from them, what their objectives and needs are and what are their idols.

We attempt to stimulate young people to consider their personal idols as the highest standard of something that they or that we are all aiming at. Do we really want anonymous experts and manipulators to offer and impose mental complexes of daily behaviour on us or that they are transformed into «somebody else's clones».

5　Fundamental Educational Values and the Virtual Reality World

To marginalize certain basic educational values, manipulators will apply all «modern» means and advantages - particularly of technology – presenting them as indispensable conditions for «new progressive education». One of the critical views on the trivialisation of education values can be found with Platonov, who says: «We educate children in corruption and immorality and call it progressive education. We are wading in the pornography and blasphemy and call it freedom of speech or expression. We mock the spiritual heritage of our ancestors and call it enlightenment» (2002, 50). Due to their stage of development, children and young people will be a population subject to various influences and thus to numerous forms of possible manipulation and «seduction» towards a «new» and often imaginary «virtual progressive» world. Intrigued by

various unsuitable contents and even «virtual» life, which is offered to children and young people, we consider some of the series of problems and cases where basic educational values are rendered trivial and pushed to the margin, pointing out to their alleged educational and pedagogic «nonsense» and their often overt entry into the area of manipulating children.

Self-declared and very often anonymous «experts» offer children and young people numerous ways of leaving the real world and entering a virtual life as a way of escaping from oneself, family, school or achievements. Some young people, stimulated by the idea of a «virtual life», even wish to create themselves as a virtual person and spend a part of the day with their virtually created partner in a virtual city, in a virtual apartment, watch a movie in a virtual theatre, swim in a virtual sea, sleep in a virtual bed, have virtual children and a virtual pet.

Following the inter-disciplinary and human-development theories about man as a unique individual, it seems necessary to raise the question of why young people often wish to be somebody else – "someone else's clone". For instance, in the USA every other teenager wants the gift of a plastic surgery for his or her 18th birthday (breast implants, silicone filling for lips, the backside, operation on the nose, only in order to look like their idols as much as possible). In Germany, every third teenager is a victim of this trend (Spiegel, 05th February 2004, more in: Miliša and Zloković, 2008). It is alarming that children no older than 14 years should demand that their parents let them have an operation to make sure that they look as much like their idols as possible. In Germany, this trend has covered every third teenager. (Miliša and Zloković, 2008). Obviously, morals and losing one's identity do not count. The aggressiveness of capital, in which media and technology seem to have a rather large share of responsibility and which goes for the parents as well as some will indifferently let their own children be sophisticatedly manipulated – or even with approval. Instead of creativity, children are offered idleness as a value and mediocrity and banality are elevated to the rank of desired virtues. In the television repertoire, programmes like Big Brother begin to like even slavery. (Tylor, Brainwashing, 2006 in: Miliša and Zloković, 2008). At the same time, a mere demand to comply with some basic rules of behaviour at home or in school is quickly considered tyranny and an incomprehensible encroachment into a young person's intimate space. Instead of promoting the development of personality and of real life, a world of fiction is offered full of glitter and false glamour. The desire to be important and prominent or for quick earnings, escaping responsibility for oneself and for others, seems to override all criteria of human dignity. It seems that, in relation to development and promoting the basic human and educational values, the commercialization of everything that can be sold at a profit has become the priority. The objective is to turn everything into a good commodity – somebody else's and one's own private and intimate life, underwear, the birth of a child and even death, particularly of the famous or notorious. A manipulator is an excellent crea-

tor of false needs and a designer of mental maps. Instead of cosmic dimensions, the young are offered an infinite chaotic depth, from which they are unable to exit once curiosity has been satisfied. The exit has a price that is not payable in one lump. A manipulator does everything to get closer to the young, to woo them, to please them but not to awaken their intellectual curiosity.

"He" knows their needs perfectly. He skilfully moulds these real needs into false ones. He will, for instance, never say that it is a sin to indulge in addictive pleasures. Instead, his message will be about how to, e.g., "cure depression" in the biggest shopping mall in the city. On the other hand, before and after that mad therapeutic shopping spree, the educators will say that there is no capital that may replace basic values and spiritual investments into oneself (Alborghetti, 2007a).

There are many cases of social regression, of making things trivial and of changing theses that are educational and moral. The criticism, though rare and lukewarm, will be declared not well meant (at least) and not in the best interest of "progress".

6 Virtual Life – Progressive Education or Profit?

There are numerous cases of media and «virtual» content offered to children and young people becoming less and less places of quality and analytical value, of confronting different views and numerous others very important functions of technology, instead becoming media who sacrifice themselves for the benefit of profit, sensationalism and triviality. The culture of silence and sacrifice, general human educational values for the benefit of profit and the transformation of a human being into a thing, plaything or someone's profitable and obedient machine, all contributes to a situation where virtual life is presented as progressive education.

While analysing social and educational trends, sociologists, pedagogues and psychologists (and others) point to a general «crisis of values». The public will often say that the family and school are the culprits for such situation in society. There is no question that these are two key subjects in promoting the development and education of children. However, the problem needs to be considered in a broader social context of values. In such a context, it is worthwhile to attempt finding a reply for the question: «Why has school become obsolete in a time of top scientific achievements?»

Observing the problems of the marginalization of education from the "system of social values", opinions emerge that are spurred by numerous negative events in the modern world. They call for a return to traditional values and for the reformation of modern society (Gillis, 2000; Hoblaj, 2008).

By briefly presenting considerations on the attitude of education towards manipulation, we can observe that, in order to resist the standardisation of behaviour and the mind, it is necessary to have the courage to confront not

only the manipulator but oneself as well, with one's own needs and desires, with decisions about our own aims, to clarify who our own idols are, what we are told, what is expected from us, as well as if we really wish to have maps of our daily behaviour imposed on us (Giddens, 1990).

Conscious of the complexity of the problem, we do not plan to cover everything, only to consider some questions that confront modern pedagogy from a pedagogical point of view, believing that, in the context of new international and national initiatives in the field of protecting and ensuring the welfare of children and young people, we shall also contribute towards raising the level of cultural responsibility to them. We believe that young people need to be taught how to use social progress, "virtual life" and the media as a means of personal expression and social activism, where positive human characteristics and achievements are promoted (Zloković, Dečman Dobrnjič & Černetič, 2007).

After all, Kant (in Platonov, 2002) said a long time ago that *the only part of universe that can be changed is us.* And also, with reference to values and morals, he thought that *there is a sky with stars above us and the moral law within us.*

7 Conclusion

Education, as a phenomenon, is the subject of studies and papers in various disciplines, as well as a subject for disputes. While, in the contemporary definitions of education, the basic objectives are self-realization and the full development of an independent and free personality, liberation from any inequality of rights, the creation of abilities and equality in participation in all social levels, all forms and sources of manipulation that virtual reality offers abundantly have one basic objective – exclusively to create a personal profit. Education is also a phenomenon that has been developed over the course of time in various civilisations. Consideration of this complex phenomenon has become a topical subject of the 21st century. An answer to the question of what education is – is it omnipotent or impotent, are there limits, definitions, senses, purposes, objectives, tasks, contents and methods for its realization and educational influences; do we educate a child even when we think we do not do so at all. These are just a few of the infinite number of questions that make the experts from various scientific fields think that it is just as deep as the secret of the human being itself. The recognition of education means the recognition of a man. Education – whether educated or not educated – or re-education, the antagonisms of education or educational manipulation are mentioned in highly diverse situations of life. The pluralism of theories on education, which offer various answers to the phenomenon, leads to a conviction of its complexity (Alborghetti, 2007b).

To realize one's personal objectives and benefits, a man will be managed as an «object», which becomes the manipulators' «thing», «plaything» or «work machine». The manipulation of a human being, particularly a child is rarely easily or readily spotted. It is masked by different messages and phrases, which can be read as: «We do the thinking for you», as well as many other messages that children or young people may be subject to for various reasons.

The «virtual life» is a metaphor used to describe the uncritical acceptance and consent to the serial production and perception of the world around us, to the imposing of mental schemes, to accepting the world of glitter and glamour which (too) often causes a darkening of personality, morals and uniformity in the post-modern generations of children. However, it is true that sometimes we ourselves agree may almost consciously with that «virtual life» and with the manipulator's requirements – not wishing to undertake the responsibility for one's own destiny and actions and not wishing to «fight» the problems.

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Otroci in virtualna resničnost - nekaj vzgojnih dilem

Možni odgovori na ekstremno, kompleksno in delikatno vprašanje o vplivu virtualnega okolja na otroke kot edinstvene osebnosti, vpliv na njegov psihosocialni razvoj in splošno vzgojo otroka, se lahko pridobijo z resnimi raziskavami, kot je na primer raziskovanje po "cohort sequentional" metodi in z drugimi podobnih raziskavami s področja vzgojnih in drugih družbenih dejavnosti.

V spodnjem članku so konfrontirane neke aktualne dileme sodobnega sveta, še posebej s stališča tradicionalnih "zastarelih" vzgojnih vrednot, tako družine kot šole in s stališča "progresivne vzgoje" , ki jo ponuja sodobno virtualno okolje. Konfrontacije se dotikajo socialnih okolij in standardov vedenja s stališča percepcije vrednot sveta in posameznika. Pogoste posledice agresivnih medijev v prikazovanju "progresivnega" vizualnega okolja brez "alternative" ima pogosto za posledico, da otroci živijo v virtualnem svetu, z virtualnimi prijatelji in z virtualno vzgojo in izobraževanjem. Na področju vzgoje se v svetu sodobnih virtualnih ponudb postavlja pomembno vprašanje: kako se obnašati v dani situaciji ali kako mlade usmerjati k selekciji tega, kar jim nudi virtualna resničnost v primerjavi z dejanskim svetom.

Ključne besede: virtualna resničnost, vzgoja, okolje, družina, šola

Implementation, Effectiveness and Experience With Remote Laboratory in Engineering Education

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Modern educational methods bring many new challenges from the pedagogical, as well as from the technical aspect. One of the more significant is the integration of information and communication technology into the educational process. These is particularly noticeable in the engineering education where the requests of the industry for a faster and more efficient acquisition of knowledge and practical skills lead to a constant search for new solutions in the learning process which would attract and motivate students, as well as be user friendly. This is especially difficult to be reached with the practical education which is usually composed of laboratory exercises that are bound to a specific time and place. One of the possible solutions are the remote laboratories which offer the possibility of the implementation of real remote laboratory experiments in the educational institutions' laboratories and, therefore, enhance the students' knowledge and capability for dealing with some technical problems without the need for their physical presence in the laboratory. In the article, the example of a successful implementation of the remote laboratory in the field of engineering, developed and operating in the Moodle environment, is presented. The laboratory does not only represent the framework for the experiment implementation, but it also offers courses with complete documentation, therefore courses can be performed on distance. As an example, the case of the most widely used course from remote laboratory is presented, i.e., the "Control of nonlinear mechanism" course. Special attention is given to the description of the booking process for remote experiments, the execution of remote experiments and the applied user interface. The evaluation of the interface usability from the point of view of end users was performed via the acknowledged SUMI method. Additionally, another questionnaire was prepared in order to investigate the students' opinion about working in the remote laboratory. The results have shown that the presented remote laboratory is user friendly and accepted by both teachers and students as a suitable and interesting supplement to the conventional laboratory exercises.

Key words: Remote laboratory, Mechatronics, Usability evaluation.

1 Introduction

Due to the increasing use of information and communication technology (ICT), modern educational processes bring numerous changes in all areas. These changes are also visible in the fact that we are ever more willing and fast in our transition from the traditional learning to e-learning. E-learning represents the integration of the use of multimedia tools, as well as web media and communication tools (Downes, 2005). Moreover, a transition from traditional learning to constructivistic learning (Huitt, 2003), as well as finding solutions for problems where the importance of the students' own researching and designing their knowledge with practical work, followed by the group discussions of the problems and learning by doing is increasing (Costa et al., 2007; Alterovitz and Ramoni, 2007). In this way the students are learning to manage and solve complex problems from various perspectives.

One of the most important aspects of the designing of a quality study process in the field of technical engineering education is adequately prepared and designed laboratory work. Especially the industry expects from the educational institutions that the students will in the course of their studies gain practical experience by using the systems they will be later on operating with, especially due to the pressure of the market and a fast development of engineering (Åström, 1994). For this purpose, the educational institutions prepare laboratory exercises in such a way that the students have the chance of gaining knowledge by working on experiments and systems and performing the analyses by themselves, (Bauer et al., 2007).

Such laboratory work with concrete experimental devices demands time and physical presence of the students, as well as of the teaching staff. Moreover, suitable adjusting of dates for the live performance of laboratory

exercises is necessary. This can be particularly difficult, especially with larger classes of students. Furthermore, the preparation of suitable laboratory experiment for larger classes demands greater financial investments (Nedic et al., 2003). To solve the problems of live laboratory exercises at an educational institution, a need for offering the students additional possibilities for acquiring knowledge of experimental systems outside the real laboratory, i.e., without their direct physical presence, is visible. Thus, the following approaches, which are supported via the World Wide Web, are increasing in use (Bencomo, 2004):

- videos of exercise implementations,
- virtual laboratory experiments and
- remote laboratory experiments.

Despite the constantly increasing popularity of the video in the World Wide Web, the video lacks interactivity and it is for this reason that the students cannot get practical experience, but only the basic insight into the exercises. The other alternative is virtual laboratories which offer simulation environments. These environments offer the chance that the students familiarize themselves with the theoretical aspects and perform experiments in a certain interactive virtual environment that can be two- or three-dimensional.

Although virtual laboratories can be quite attractive (e.g., Boeing 777 flight simulator) (Trego, 1995), they are only a poor substitute for practical work on physical devices, because simulations cannot include all the aspects of the real world. For this reason, remote laboratory experiments which offer practical work on real devices on distance are increasingly being introduced. Among the first remote laboratories were the laboratory experiments in robotics (Taylor and Trevelyan, 1995) and system control (Bohus et al., 1995). For a certain institution, especially in the case where the institutions are cooperating with other institutions in the preparation process of the laboratory experiments, this means fewer investments into the necessary technology.

On the whole, it is being ascertained that planning and development of remote laboratory experiments which are included in the direct environment of e-contents is not a simple process. The materials and equipment, as well as the interaction have to be adequately planned, elaborated and evaluated for their usability.

In our research, we wanted to find the answer to the question of how to design remote laboratory experiments so that they are going to be an efficient replacement of real laboratory exercises. Thus, we were focusing on the following aspects:

- the explanation of the remote laboratory experiment implementation and its learning objectives on an example of nonlinear system control in the field of engineering,
- the explanation of didactical experience in working with the students on distance where it was established how the students accept remote laboratory experiments in comparison with real experiments in the laboratory,

- the description of the usability evaluation of the system for remote experiments which was done via the standardized method SUMI.

2 Implementation of remote exercises

With distance education, there are, from the perspective of teaching methods, various chances of the implementation of remote exercises, such as individual approaches, approaches one-to-many and approaches many-to-many (Cohen et al., 2004). Individual methods, among other things, include the implementation of interviews, preparation of seminar papers, implementation of various e-contents and other forms where the students perform the tasks individually. The methods one-to-many with distance education usually include the presentation of the assistant with the aid of videoconference, streaming video or webcasting (Reynolds et al., 2008) and lately also with hypervideo technology which enables interactivity within the video (Debevc et al., 2008). With the method many-to-many, we are dealing with discussion groups, debates, simulations, case studies and project work.

Due to the extreme development of the ICT, it is today possible to enable the students a high degree of interactivity and cooperation with the implementation of remote exercises without the physical presence. Despite this, the social contact can be maintained with the aid of adequate communication and remote discussion tools. Nowadays, computer technology offers (Bencomo, 2004):

- better human-computer interaction,
- more natural and intuitive graphical user interfaces,
- high degree of interactivity,
- access to remote computer applications.

In the field of engineering, it is important for the students that in their studies and exercise implementation they get acquainted with the physical laws that describe the operation of these systems. Scientists and engineers usually use computers for calculating and graphical imaging of the responses of these technical systems onto various initial states and inputs. With technical systems, we are thus tackling time responses, spectra, Bode and Nyquist diagrams, etc. The knowledge and comprehension of these basic system descriptions represent one of the important aspects for the comprehension of the operation of technical systems.

The development of ICT and distance education have thus provided the students the chance to get acquainted with technical systems according to an individual didactical method in the World Wide Web and to perform remote exercises independent of time and place, so that they the students are performing the experiments and solving problems. Didactically speaking, it is about the principle of problem learning and learning by doing. These are student-oriented learning processes where the teacher is not in the main focus, but on the side and intervenes only when necessary.

Didactically speaking, the use of remote laboratories provides the students with the access to experiments 24 hours per day and from any location whatsoever. An even

greater advantage for the students is that they can, if they want and understand it, perform the exercise quickly. On the other hand, they can also take some more time and repeat the exercise in a greater detail with the goal of improving their comprehension of the system operation and its reactions if they find it difficult. By this, the learning process is improved, because there is constant link between the theory and practice, so that the students on real devices examine theoretical bases and gain the necessary practical experience and skills which are fundamental in the engineering studies.

On the other hand, remote laboratories and the implementation of remote exercises offer an equal inclusion into the learning process also to the persons with special needs. In this way, better position in the modern, technologically-driven society is enabled for them.

3   Remote laboratory for automation and mechatronics

As an example, we will present a remote laboratory which is intended for the students in the field of automation and mechatronics and which was constructed at the University of Maribor, Faculty of Electrical Engineering and Computer Science (Hercog et al. 2007). The purpose of the remote laboratory is offering students and lecturers an alternative way of implementing the regular learning process or for its supplementation. In the framework of the remote laboratory, there are more extensive courses at disposal and they cover the basic theory from the field of operation, modeling, simulation, control, design and implementation of electrical and mechatronic device. The courses, which demand on average 50 hours of intensive work from the students, are practially oriented. Focus point of every course are remote experiments.

The web portal of the remote laboratory was designed and constructed in the framework of the Moodle webcasting tool with which the user management and the inclusion of the web learning materials were facilitated (Brandl, 2005). The access to the contents of the remote laboratory is enabled only for registered users. The registration is free of charge and it is possible to register right on the web portal of the remote laboratory. All the data and necessary documentation are at disposal in Slovenian, as well as in the English language which enables the use of the laboratories to foreign students, as well.

The basic, introductory website is designed in such a way that it offers the users by entering into the system

Figure 1: Introductory website of a remote laboratory

all the necessary data about the laboratory, this being the description of the remote laboratory, the possibility of logging into the system and the necessary data for the implementation of exercises in the private environment (Figure 1 – functions of the remote laboratory). Additionally, the programs which the students must download on their own computers are also at their disposal. These are the programs which are necessary for the operation of the LabVIEW environment and for the video presentation of remote experiment.

3.1 Remote laboratory architecture and principle of operation

Remote laboratory is composed of the laboratory server, DSP-2 control systems and several objects under control (Figure 2). DSP-2 control systems are connected to the lab server which is, in turn, connected to the Internet. Embedded control systems execute predefined control algorithms and through the analogue and digital I/O signals drive the real process (DC motor, nonlinear mechanism, SCARA robot). At the same time, data visualization and parameter tuning program is running on the lab server. This program receives selected data from the control system and displays them in the experiment graphical user interface (GUI). Each experiment GUI also contains controller parameters which can be changed on-the-fly by the user. On each value change event, new parameter value is transmitted to the control system. Experiments GUI, which are created using LabVIEW, are further published on the Web using a LabVIEW built-in Web Publishing Tool. Once the GUI is published, anyone on the Web can access and control an experiment using the standard Web browser.

Two additional servers are also running on the labs server: (1) Web server and (2) visualization server. The first one is responsible for displaying remote laboratory web pages while the latter enables live video broadcasting. Visualization solution is based on client-server architecture (Gergič and Hercog, 2006). Server application grabs the images from FireWire cameras, located inside the remote laboratory, and sends JPEG (Joint Photographic Experts Group) compressed images to the client application which decompresses and displays the received images to the remote user.

3.2 Courses in remote laboratory

When the student logs in the system, groups of courses appear. For each course, adequate documentation is prepared in the remote laboratory, as well as remote experiments. In the documentation, all key data for teachers and students are stated, together with those that are necessary for the informing about the course and for a successful implementation of the course. Inside a specific course, the following is at the ones' disposal:

- Course Overview,
- Course Objectives,
- Documentation,
- Execution,
- Authors,
- Poster, Photo Gallery and other materials.

In the "Course Overview" section, the data of the course, the necessary entering conditions, the structure of the course and the evaluated time demandness are stated. The description of the course includes a short summary of the course and a description of the main chapters. Its basic purpose is to provide the user with a basic description in a few sentences. The necessary entering conditions include the description of the necessary knowledge which are the basis for the comprehension and implementation of the course. The conditions are stated as concrete conditions in the sense of the knowledge which is required. Thus, the knowledge of, e.g., physics at the high-school level can be required, the knowledge of the linear algebra basics, etc. Also the requirements concerning knowledge of programming in specific programs are stated here. The course structure shows logical units or modules which the course is composed of. Usually, one logical unit corresponds to one chapter in the documentation. The structure of the course is sometimes presented in the graphical form, so
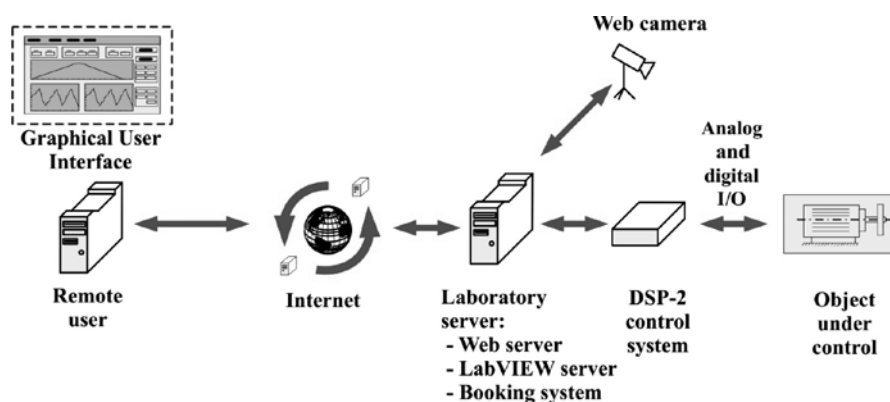

Figure 2: Block scheme of remote laboratory

that it is visible how the individual modules are combined and in what order they can be performed. Time demandness defines the necessary average time for each logical unit or module of the course, as well as the total time which is needed for the entire course execution.

In the "Course Objectives" section, course objectives are concisely stated, together with the expected learning outcomes and the suggested method of achieving the desired learning outcomes. The expected learning outcomes relate to a gained knowledge or skills, while the suggested method of achieving the learning outcomes describes the related procedures.

In the "Documentation" section, all theoretical background of the course is stated, together with the necessary literature for additional studying. The theory is combined with the exercises for students which can be theoretical, computational and simulation exercises, or remote experiments. With each task, it is specifically stated what the task of the student is and what results, together with their comments, must be in the report which the students should provide their mentor with.

Furthermore, there is also documentation for the teacher at disposal. Besides the key to the exercises, it also offers advice on how to include the course into the study program, as well as the description of the most common problems that appear with the practical implementation of the course. This documentation can be provided on a specific demand from the author of the course and is not posted on the website of the laboratory.

In the "Implementation" section, all the necessary data which are needed for the practical implementation of remote experiments are collected. Besides the short description of the experiments and the instruction for the implementation of experiments, also the necessary software, is available (See Figure 3).

On the website, there is also the link to the booking table for the reservation of dates of the remote experiment implementation (See Figure 4). With the aid of this table, the users can make a reservation of a date which suits them best for the implementation of the remote experiment. The booking table is one of the most important elements for a successful use of the remote laboratory, because it regulates the access to the experiment in such a way that only one user can use it on the reserved date and time. The user simply clicks on the desired date and time and the colour of the date and time change, adequately. Those, marked in green, are still free, while those, marked in red, are occupied.
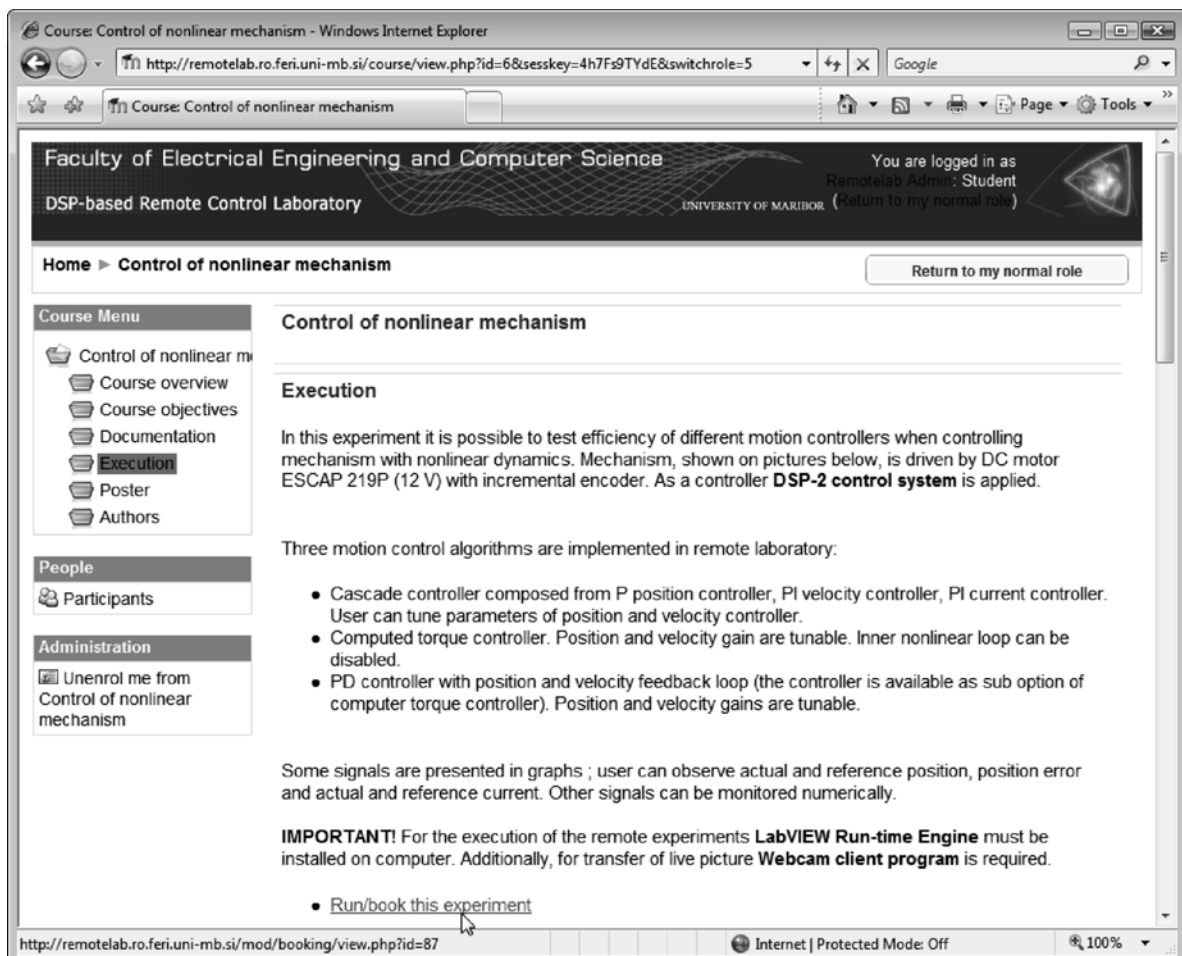

Figure 3: Implementation of a remote experiment, website

Figure 4: Booking table

4 The "Control of nonlinear mechanism" course

The most widely used course which was constructed in the framework of the remote laboratory is the "Control of nonlinear mechanism" course which covers an extensive topic of modeling, simulation, planning and practical implementation of the motion control of mechatronic device with nonlinear dynamics. All this is an important part of the modern education of electrical engineers, machine engineers and mechatronics engineers. In the course, all basic elements are included which enable the student with adequate pre-knowledge an insight into the problem, an acquisition of some new knowledge and practical experience.

Learning objectives of the "Control of nonlinear mechanism" course are the following:

- Modeling of the mechatronic device with the nonlinear dynamic of mechanical work.
- Planning, implementation and optimization of the linear regulator with the cascade structure (cascade

P position, PI speed and PI current controller) for the position control of the mechanism with nonlinear dynamics.

- Planning, implementation and optimization of the nonlinear position controller based on the mechanism dynamic model.
- Understanding the reasons for variations in efficiency of the use of linear and nonlinear control methods in the case of nonlinear mechanism control.

As a practical example in the course and an experimental device in the remote laboratory, the mechatronic device called mechanism with a spring with a DSP-2 control system is used (Hercog and Jezernik, 2005) (Figure 5).

The first part of the course is intended for familiarization with the theory and it is in each chapter supplemented with an example that represents the use of theory on a practical example of the mechanism with a spring. Thus, in an example of a basic dynamic mechanism model, the dynamic model of the mechanism with a spring is explained, as well as the construction of the suitable MATLAB/Simulink simulation model and the simula-
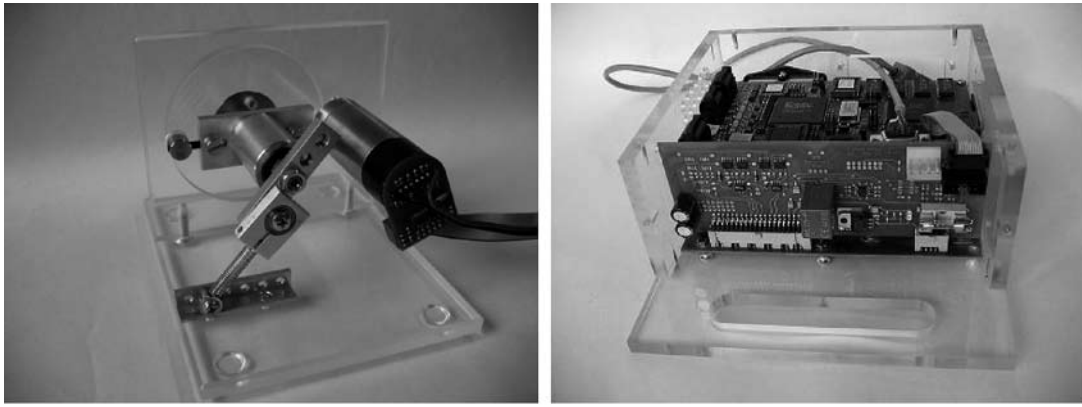
Figure 5: Mechanism with a spring and a DSP-2 control system

tions results. After that, the theory on the motion control follows, together with the design of suitable controllers and their implementation for the motion control of the mechanism with a spring. After the theoretical part with the simulations, the experiments in the remote laboratory follow. The user interface with which the students perform remote experiments enables the implementation of three various control methods, the setting of their parameters and the presentation of the measured results. This is presented in Figure 6. The image of the live experiment is also possible to see via the webcam.

5   User responses in remote laboratory work

After the implementation of the "Control of nonlinear mechanism" course, the students have filled in an anonymous questionnaire in which we have asked them about their opinion on the performance of remote experiments and its inclusion into the regular study process. 18 students answered the questionnaire.

It was shown that all the students have the necessary equipment for the performance of remote laboratories from their home (personal computer, fast Internet connection), so there were no limitations in the case of equipment.

94 % of students think that remote laboratories are a useful addition to ordinary laboratory exercises, while only 22 % are of the opinion that remote experiments could entirely replace ordinary laboratory exercises.

94 % are of the opinion that remote experiments are suitable for the strengthening and repetition of knowledge which they have already gained. 72 % have the opinion that remote laboratories are suitable also for gaining new knowledge.

For 39 % of students, it was in the "Control of nonlinear mechanism" course in which they performed remote experiments for the first time and this shows quite a low representation of this kind of work in the regular teaching process.

Despite the fact that remote experiments can be performed independently of the place and time, 61 % of the students prefer performing the experiments in the laboratory to remote experiments, 33 % could not decide for one option, 6 % (i.e., 1 student) prefer remote experiments.

As much as 78 % of students have the opinion that they learn more in laboratory work than in remote experiments. The other 22 % could not decide for one option.

6   The evaluation of the usability of the remote experiment interface

One of the more important characteristics of the remote experiment system is system usability, because it highly influenced the acceptance of the system with users (Holzinger, 2005). Furthermore, the usability is one of the important factors of evaluation of e-learning technologies and systems. There are more definitions of usability. All include many factors, such as gaining skills, facilitated use, efficiency of the system, and contentedness of the end user. Moreover, there are many evaluation techniques at our disposal which are useful in the evaluation of usability. The choice is dependent upon what we are evaluating, which software and computer equipment we are using, which users we are testing, and what our financial resources are.

For our project, we have, due to the facilitation and fast acquisition of the first impression on the usability, used the Software Usability Measurement Inventory (SUMI) technique (Kirakowski and Corbett, 1993). The tool, which is considered to be standardised in the framework of the ISO 9241 [BEVAN] standard, is composed of the printed-out questionnaire with 50 questions on which those who are being questioned reply in such a way that they choose the answer on a three-grade scale (I agree, I neither agree nor disagree, I do not agree).

The questionnaire is composed in such a way that it measures five main aspects, which are:
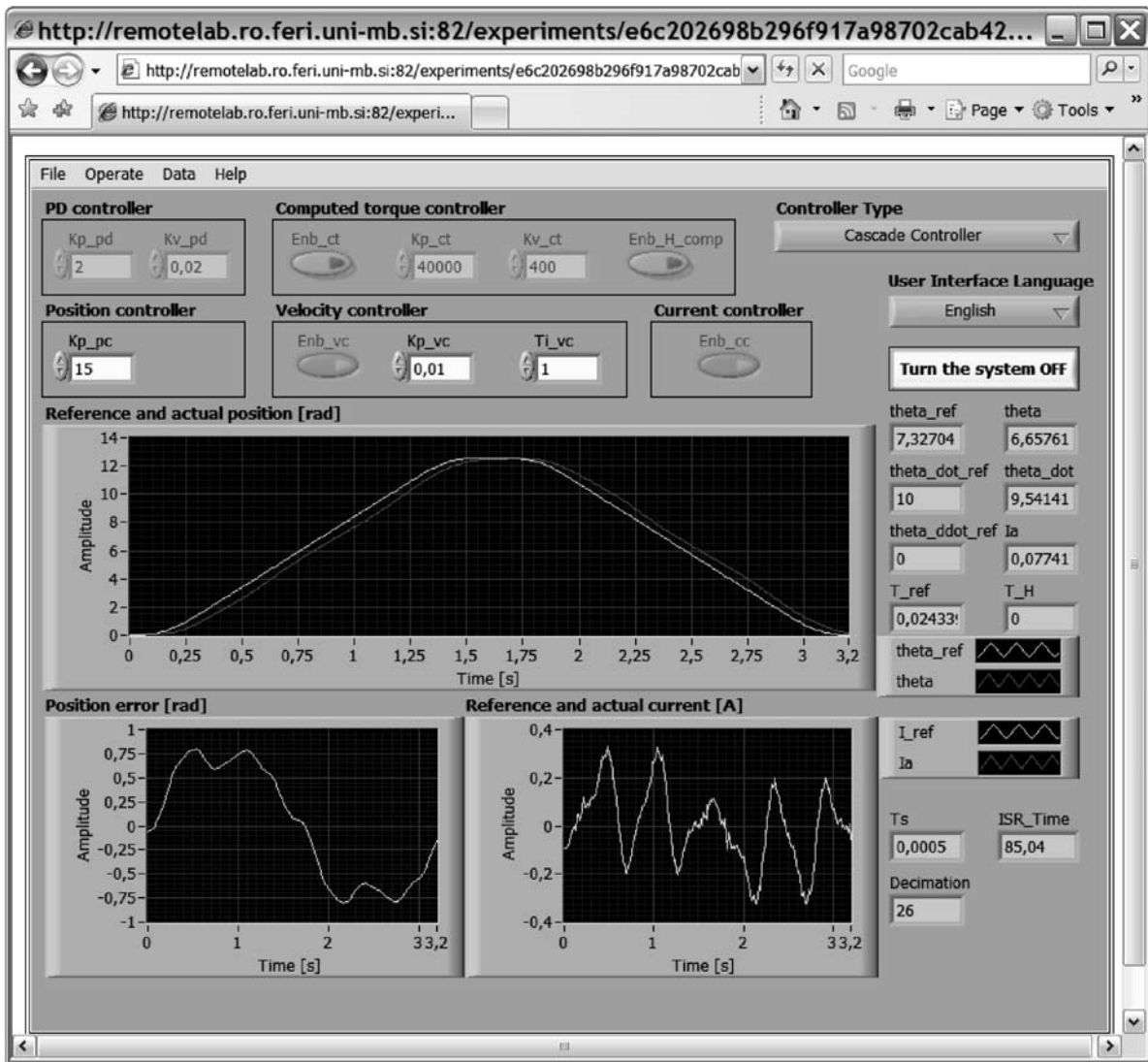
Figure 6: User interface for the implementation of remote experiments

- **effectiveness;** represents the feeling of the users that they managed to perform the task fast, successfully and economically. The extreme opposition is that the program impedes the performance of the task.
- **affect;** represents the psychological expression for the description of the feeling which in this context combines the feeling of the users when working with the program – stimulative and pleasant.
- **efficiency;** we are evaluating if the users have the feeling that the communication with the program is easy and clear, as well as if the program is willing to "help" them solve the problems.
- **control;** we are evaluating the feeling in users whether the program is consistently responding to their commands and the input data.
- **learnability;** (ang. learnability) represents the feeling of the users that it was relatively easy to learn using the programme and that the instructions and other materials were readable and useful.

The gained data are processed with the SUMISCO programme, which evaluates the results of the questionnaire and compares them to the standardized database. In Table 1 and Figure 7, quantitative measurements of the system usability which were gained with the aid of 18 students who have performed the test remote experiment are presented. The Median is the middle score when the scores are arranged in numerical order. It is the indicative sample statistic for each usability scale. The Ucl and Lcl are the Upper and Lower Confidence Limits. They represent the limits within which the theoretical true score lies 95 % of the time for this sample of users. From Table 1 and Figure 7 is thus seen that the area that defines the aspect of usability (aspect Global in Figure 7) is in our case completely above the median 50 and with a low dispersion of answers (from 55 to 63). This information tells us that the system was successful in the usability aspect.

Table 1: Statistical values of certain usability aspects of the materials

Scale	LCL	Median	UCL
GLOBAL	**55**	**59**	**63**
Efficiency	**53**	**58**	**62**
Affect	**56**	**60**	**64**
Helpfulness	**57**	**61**	**64**
Control	**45**	**50**	**54**
Learnability	**50**	**56**	**61**

If we take a closer look at the other aspects in Figure 7, we notice the following:

- the "Effectiveness" aspect is almost identical with the aspect Global; however, there is a slightly lower value which tells us that the system was usable.
- the "Affect" and "Efficiency" aspects have proven to be the best aspects, as well as the answers have proven to be uniform due to the fact that the dispersion of the answers was similar and small.
- the "Control" aspect with the mean value lies exactly on the mean value and due to the greater dispersion under the mean value, which means that the usability interface was not completely satisfactory from the perspective of control. This aspect was expected,
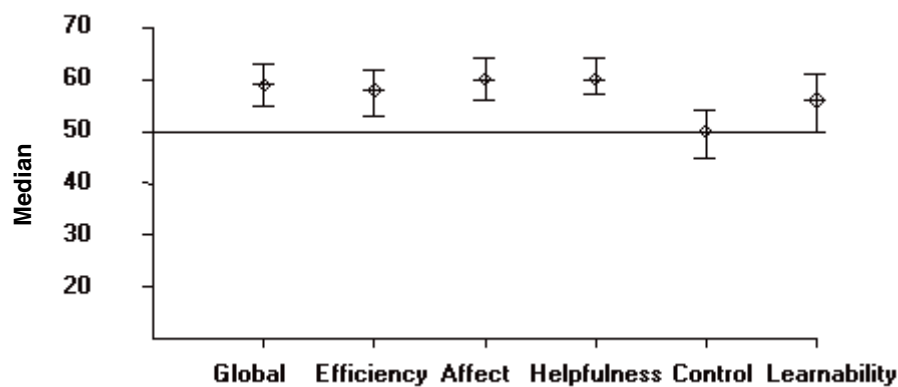
Figure 7: Graphical comparison of certain usability aspects with the SUMI evaluation

because the system, still being in the initial implementation phase, has stopped working. The students had to wait for the intervention of the administrator who has re-enabled the system.

- the "Learnability"aspect presents us with the information whether the students had some problems with their comprehension of how to handle (manipulate) the system.

With the joint results and the results of specific aspects separately, the SUMI approach offers the information about specific questions of the questionnaire. This analysis is called Item Consensual Analysis. SUMISCO compares the results of each individual item with the anticipated value in the standardized database with the use of χ^2-test. Those items which are most deviated are marked in the print-out, separately.

Among the individual questions which had the greatest deviation from the mean value out of all (with more than 99.99 % reliability) are some positive opinions, e.g., "Documentation is informative" and "I know what I have to do in the next step".

It is visible from the results that the user interface was on the whole extremely successful and that the students were extremely in favour of remote experiments. The only improvement that must be done is improving the system stability and increasing the aspect of control.

7 Conclusion

In this article, a state-of-the-art approach to engineering education where the ordinary laboratory experimental work is supplemented or entirely replaced with remote laboratories is presented. Such a way of work has numerous advantages, because it enables the students and the teachers a greater flexibility as far as the time and place of the implementation are concerned, as well as solves the problem of lack of experimental devices and/or larger classes of students. Furthermore, it is essential to realize what limitations such an approach has, because working with remote experiments does not completely equal practical experience which direct laboratory work with devices produces. Moreover, the students' answers which were gained via the questionnaire show that although the students find the remote experiments useful and an interesting supplementation of regular laboratory work,

there is just a few of those who are of the opinion that such an approach could entirely replace laboratory work. Likewise, a great majority of students are of the opinion that they learn more in laboratory work than in remote experiments.

In the framework of this article, the evaluation of the usability of the remote experiment interface was also performed and it showed that the user interface was user friendly, but there is greater cautiousness necessary with enabling a better stability of the system. For this reason, it is highly important to place greater emphasis on the further development of remote laboratory technology, by chance also in the way that various institutions form connections into a unified system of remote laboratories. With this, the offer and quality of remote experiments for the students of a certain institution would improve.

Acknowledgment

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Implementacija, učinkovitost in izkušnje z oddaljenim laboratorijem za poučevanje tehnike

Sodobni izobraževalni procesi prinašajo s seboj nove pedagoške in tehnične izzive, pri čemer je posebej zahtevna učinkovita integracija informacijske in komunikacijske tehnologije v učne procese. Zaradi zahtev in potreb industrije po hitrejšem in učinkovitejšem pridobivanju praktičnih izkušenj se iščejo nove rešitve, ki bi pritegnile in motivirale študente za dodatno pridobivanje znanja. Ti procesi so posebej izraziti pri poučevanju tehnike. Največjo težavo pri tem predstavlja izvajanje laboratorijskih vaj, ki zahtevajo uporabnikovo prisotnost v laboratoriju. Ena od rešitev so oddaljeni laboratoriji, ki nudijo izvajanje laboratorijskih eksperimentov preko spleta, kar zmanjša potrebnost neposredne fizične prisotnosti študentov in povečuje možnosti za izboljšanje znanja študentov za reševanje določenih tehniških problemov. V članku je predstavljen primer uspešne izvedbe oddaljenega laboratorija za področje tehnike skupaj s tečajem, ki deluje v okolju Moodle. Podrobneje je opisan tečaj 'Vodenje nelinearnega mehanizma'. Laboratorij namreč ne predstavlja samo orodja za izvajanje oddaljenih eksperimentov, pač pa ponuja celotne tečaje s popolno dokumentacijo, ki omogoča učenje na daljavo. Posebej je izpostavljen postopek prijavljanja na izvajanje oddaljenih eksperimentov ter sama izvedba vaje skupaj z opisom grafičnega uporabniškega vmesnika. Izvedena je bila tudi evaluacija s priznano metodo SUMI za ocenjevanje uporabniške prijaznosti sistema. Prav tako se je ugotavljal odziv študentov na delo z oddaljenim laboratorijem. Rezultati raziskav so pokazali, da je v delu predstavljen oddaljeni laboratorij ustrezno uporabniško prijazen in s strani študentov in učiteljev sprejet kot primerna in zanimiva dopolnitev klasičnih laboratorijskih vaj.

Ključne besede: Oddaljeni laboratorij, Mehatronika, Ocenjevanje uporabniške prijaznosti.

UNIVERZA V MARIBORU - FAKULTETA ZA ORGANIZACIJSKE VEDE

ZAPOSLIMO
Ustvarjalne
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Samozavestne

Kadrovanje

VESNA NOVAK

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Digitalna kompetenca in njeno izgrajevanje

Rado Wechtersbach

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S prenovo srednjega izobraževanja so bile tudi v slovensko preduniverzitetno izobraževanje uvedene kompetence. V prispevku je prikazano zgodovinsko ozadje kompetenc in njihovega vpeljevanja v izobraževalni sistem Združenih držav Amerike in Evrope. Ker opredelitev kompetenc v slovenski strokovni javnosti ni povsem enotna, je v nadaljevanju izpostavljena operativna opredelitev, ki je bila uporabljena pri prenovi predmeta Informatika v gimnazijskem programu in kako je zamišljeno njeno izgrajevanje, vrednotenje ter ocenjevanje.

Ključne besede: kompetence, trendi v izobraževanju, informatika, gimnazija.

1 Uvod

Iz preteklosti in iz sodobnosti je razvidno, da ima vsaka tehnologija, ki jo je v svojem zgodovinskem razvoju izdelal človek, pozitivne in negativne učinke. Oboji pa so le potencialne možnosti. Ali zna posameznik in z njim družba kar najbolj izkoristiti pozitivne in minimalizirati negativne, je odvisno od znanja. Vendar ne le znanja. Za kreativno in inovativno izkoriščanje tehnologije potrebujemo ob znanju še »licenco« za njegovo uporabo. Kakšna je in v kolikšni meri nam jo je uspelo zgraditi, pa je v največji meri odvisna od izobraževanih in organizacijskih kultur v družbi. Zato ideje in teorije o uspešni informacijski družbi znanja, ki slonijo zgolj na možnostih nove tehnologije, izobraževanje pa poščajo takšno kot je, postajajo počasi neprepričljive in nezadostne. Večina takšnih zgodb v svoji naivnosti pozablja, da možnosti še niso rezultati, da znanje ne zagotavlja kvalitete življenja in da zapis ni informacija.

Računalnik in z njim povezana tehnologija nam sicer lahko pomaga pri inovativnem in učinkovitem udejstvovanju, a za to je potrebna skorajda utopična revolucija izobraževanja. Z njo naj bi odpravili sedaj prevladujočo, na učitelju slonečo strukturo, katere glavna funkcija je prenašanja znanja starejših generacij na mlajše. Mladi danes žive in ustvarjajo s tehnologijo: poslušajo njim všečno glasbo, komunicirajo z mobilniki, fotografirajo in snemajo z digitalnimi fotoaparati ter objavljajo svoje izdelke v spletu, iščejo podatke v internetu, posredujejo sporočila z SMS-i in z elektronsko pošto, ustvarjajo v blogih in debatirajo v spletnih forumih. Pri tem so aktivni in inovativni, kritično razmišljajo ter ustvarjalno sodelujejo z drugimi. Vse to jim je blizu, tehnologija je za njih izziv in motiv, ki omogoča individualnost izražanja in svobodo v drugačno-

sti. V šoli vsega tega ni in marsikaj je celo prepovedano. Učitelji, ki so novo tehnologijo spoznali in začeli uporabljati šele v svojih zrelih letih, imajo drugačne vrednote in navade. Računalnike, internet in drugo tehnologijo smatrajo le kot novo orodje za doseganje tradicionalnih in že preverjenih ciljev, manj pa kot možnost za drugačno izobraževanje. V tehnološki negotovosti si prizadevajo omejiti radovednost in kreativnost otrok, kar je za bodoči razvoj bistveno bolj nevralgična točka kot nezadostna širokopasovnost.

Prepad med mladimi in njihovimi učitelji je vse večji in globlji. Zato je umestno vprašanje: »Ali šola danes še pripravlja mlade za čas, ki prihaja?«

2 Kompetenca

S pregovorom »Ni se težko nečesa naučiti, težje je tisto, kar znamo, koristno uporabiti.« so Kitajci že zelo zgodaj opozorili na tisto, kar je kasneje dobilo ime kompetenca in je v organizacijsko znanost v 1960. letih uvedel ameriški psiholog David McClelland. Odmaknil se je namreč od do tedaj tradicionalnega pogleda, da so za uspešno delo posameznika potrebne le spretnosti, znanje in veščine, ki jih posameznik razvije z učenjem, ampak tudi njegove osebnostne značilnosti npr. njegova, spretnost, intuitivnost, vztrajnost, in motiviranost. McClelland se je zavedal, da je ugotavljanje teh značilnosti zelo težavno. Ne le, da jih lahko ugotavljamo le pri neposrednem delu, pokažejo se le pri nekaterih aktivnostih, pri drugih pa ne, vse skupaj pa je zelo odvisno tudi od trenutne razpoloženosti posameznika. Svoja razmišljanja in opazovanja sodelavcev je strnil v znamenitem članku »Testing for

Competence rather than Inteligence" (McClelland, 1973), v katerem je oblikoval tudi prvi kompetenčni model.

S svojimi razmišljanji je vzbudil veliko pozornost in v 1980. letih se je kompetenčni pristop v ameriških podjetjih že dobro uveljavil. Ker pa je bilo pojmovanje kompetenc tako zelo drugačno od tradicionalnih obravnav posameznika, je žal le malo kdo natančno vedel, kaj kompetence pravzaprav so in kaj natančno pomenijo. Izmišljali so si nove in nove kompetence ter izdelovali njihove kataloge, brez da bi jih kdorkoli empirično raziskal in povezal z kakršnimikoli vedenjskimi značilnostmi. V ospredju so imeli le nov in moderen strokovni žargon, s katerim so vplivali na izbiro kadrov. V kritiki takšnega pristopa je profesor Tony Cockerhill s sodelavci (Cockerhill, T., Hunt, J., Schroder, H. 1995) tako nepovezana vedenja in kompetence šaljivo poimenoval "Moulinex kompetence", saj gre za mešanico jabolk, hrušk, banan in pomaranč, ki naj bi v kompetenčnem mešalniku postale ananas.

Čeprav se izraz kompetenca v današnjem času vse več uporablja in se je od mcclellandovih časov njena opredelitev znatno spremenila , je njegovo pojmovanje še vedno neenotno in obremenjeno s številnimi opredelitvami. K pojmovni zmedi dodatno pripomore dejstvo, da je izraz prisoten tudi v vsakdanjem pogovornem jeziku, kjer ga največkrat pojmujemo s pravniškim pojmom pristojnost.

Analiza različnih opredelitev pojma kompetenca pokaže, da imamo opraviti z vsaj dvema različnima opredelitvama. (Štefanc, 2006) Prva temelji na postavki, da obstaja vrsta nalog, zahtev in rezultatov, ki jim mora posameznik ali skupina zadostiti, pri čemer je zmožnost za njihovo izpolnjevanje definicija kompetence. Znotraj druge pa je kompetenca razumljena kot na znanju ponotranjena zmožnost realizacije določenih operativnih nalog, ki je prilagojena vsakokratnim zahtevam.

3　Kompetenca in izobraževanje

Proti koncu prejšnjega stoletja se je poklicno izobraževanje v Združenih državah Amerike soočalo precejšnjim nezadovoljstvom javnosti. Vse več je bilo namreč dijakov, ki niso dokončali izobraževanja in niso pridobili poklica, ker niso dosegli niti minimalnih standardov znanja. Javnost se je vse pogosteje spraševala, kaj se dijaki pravzaprav učijo in ali je tisto, kar se učijo, sploh potrebno. V vsesplošnem iskanju rešitev in idej se je zdelo, da bi kompetenčni pristop prinesel še najboljšo rešitev. Njegovi zagovorniki so minimalizirali potrebo po splošnem znanju in se omejili predvsem na tisto, ki je pomembno za uspešno opravljanje poklica. Poudarjali so preverjanje z nalogami, ki jih bo dijak opravljal v realnem življenju. Če želimo npr. vedeti, kako dobro nekdo vozi avtomobil, naj to pokaže neposredno na vozniškem izpitu.

Leta 1991 je Komisija za doseganje potrebnih spretnosti v okviru Ministrstva za delo (The Secretary's Commission on Achieving Necessary Skills – SCANS) objavila raziskavo (SCANS, 1991), v kateri je opredeljenih pet kompetenc, ki jih morajo dijaki razviti z izobraževanjem za učinkovito delo in zadovoljno življenje:

- delo z viri (razporejanje časa, denarja, materiala, prostora in zaposlenih);
- medosebne spretnosti (sodelovanje v skupinah, poučevanje drugih, vodenje, pogajanje, medkulturnost);
- delo s podatki (iskanje, pridobivanje vrednotenje in uporaba podatkov, organizacija in vzdrževanje dokumentacije, predstavitve znanja, uporaba informacijske tehnologije);
- razumevanje sistemov (razumevanje družbenih, organizacijskih in tehnoloških sistemov, spremljanje in spreminjanje storilnosti, oblikovanje in izboljševanje sistemov);
- uporaba tehnologije (izbira in uporaba ustreznih tehnologij za posamezne naloge ter njihovo vzdrževanje).

Omenjene kompetence temeljijo na:

- osnovnih spretnostih (npr. branje, pisanje, aritmetika in matematika, govorno izražanje in poslušanje);
- miselnih spretnostih (npr. ustvarjalno razmišljanje, reševanje problemov, poznavanje zakonitosti učenja, iskanje in sprejemanje odločitev);
- osebnostnih lastnostih (npr. osebna odgovornost, samopodoba, socialnost, samoorganiziranost in integriteta).

Skladno s temi zahtevami, naj bi se spremenilo tudi izobraževanje. Pouk bi se moral v celoti podrediti kompetencam in naj bi temeljil na uporabnem znanju. Le-to je jasno razdvojeno od splošnega. S temi spremembami je postala vprašljiva tradicionalna naloga šol - prenašanje znanja in intelektualno ter kulturno izobraževanje - v ospredje pa je stopilo pripravljanje za delo. (Laval, 2005) Bayliss sicer trdi, da naj bi bil kurikul še vedno podoben tistemu, v katerem so se učenci pripravljali na življenje v veliko bolj stabilni in manj negotovi družbi petdesetih let prejšnjega stoletja. Potrebne pa so spremembe, ki bodo preoblikovale izobraževanje tako, da se bo bolje odzivalo na izzive življenja v 21. stoletju (Bayliss, 2001). Potrebna je torej prenova izobraževanja, jedro sprememb pa je v premiku od razvijanja vsebinskega znanja k izgrajevanju kompetenc (Štefanc, 2006).

Dogajanje prek luže ni ostalo brez odmeva tudi v Evropi. Svet Evropske unije je na predlog Evropske komisije leta 2000 v Lizboni sklenil, da mora evropski okvir, kot ključni ukrep pri odzivu Evrope na globalizacijo in premik k družbi znanja, na novo opredeliti osnovna znanja, ki naj jih zagotovi vseživljenjsko učenje. Ko je bilo poročilo zasnovano in ga je Svet leta 2001 sprejel, je postalo razvijanje veščine ena od prednostnih nalog izobraževanja.

Tega leta je pričela delovati delovna skupina Evropske komisije o temeljnih veščinah (Working group on Basic Skills, Enterepreneurship and Fereign Languages). Čeprav so bila v skupini prisotna številna razhajanja glede konceptov in opredelitev temeljnih veščin, so leta 2003 izdali poročilo, ki predstavlja osnovo za reševanje tega vprašanja. V njem so namesto izraza »veščine«, ki je v različnih evropskih kulturah razumljen zelo različno, uvedli izraz »kompetenca«. Prav tako so namesto izraza »temeljne«, ki ga večina razume kot nabor za preživetje, v

poročilu pa gre za mnogo več, uvedli izraz »ključne«. Od takrat govorimo v Evropi o ključnih kompetencah.

V poročilu je tudi opredeljenih osem ključnih kompetenc, ki predstavljajo prenosljiv paket znanja, veščin in stališč, ki jih vsi posamezniki potrebujejo za osebno izpolnitev oz. razvoj, socialno vključenost, aktivno državljanstvo in zaposljivost. Opredeljene kompetence so bile nato večkrat preimenovane in drugače razporejene. Trenutna razvrstitev kompetenc je rezultat dolgih razprav in številnih kompromisov: (Recommendation of the European Parlament and the Council, 2006):

1. komuniciranje v maternem jeziku,
2. komuniciranje v tujih jezikih,
3. matematična kompetenca in osnovne kompetence v naravoslovju in tehnologiji,
4. digitalna kompetenca,
5. učenje učenja,
6. socialne in državljanske kompetence,
7. samoiniciativnost in podjetnost ter
8. kulturna zavest in izražanje.

Evropski parlament je leta 2006 tako opredeljene kompetence podprl in poudaril, da je potrebno različne potrebe učencev zadovoljevati z nadgradnjo raznolikih individualnih kompetenc in z zagotavljanjem enakosti ter dostopnosti tistim skupinam, ki zaradi izobraževalne prikrajšanosti potrebujejo posebno podporo za izpolnitev svojega izobrazbenega potenciala. V tem smislu je podprl zahtevo, da zgradijo mladi v obveznem izobraževanju ključne kompetence do takšne ravni, ki jim bo omogočala vključenost v odraslo življenje in predstavljala ustrezno podlago za nadaljnje učenje in poklicno izobraževanje ter hkrati omogočala njihovo nadgrajevanje in posodabljanje skozi vse življenje. (Recommendation of the European Parlament and the Council, 2006)

4   Digitalna kompetenca

V literaturi in v pogovorih se pogosto odpira dilema, kaj novega pravzaprav prinaša izraz digitalna kompetenca. Če pri opredeljevanju izraza izhajamo iz kompetence, in znanje veščine, spretnosti, osebnostne in vse druge značilnosti, na katere se le-ta nanaša, vežemo na izraz digitalen, naletimo na prvo težavo. Slovar slovenskega knjižnega jezika (SSKJ, 2002) namreč razlaga izraz digitalen kot opravljen s prsti. Oxfordov slovar sodobnega angleškega jezika (Compact Oxford English Dictionary of Current English 2003) pojmuje izraz tudi kot pridevnik, ki v povezavi s podatki, opredeljuje njihov zapis s številskimi vrednostmi. Hitrost izrazimo digitalno npr. z številom metrov na sekundo in temperaturo v stopinjah. Vendar si tudi s to razlago ne moremo kaj prida pomagati. IT Knowledge Exchange (dostopno na http://searchcio-midmarket.techtarget.com) pojmuje izraz digitalen kot pridevnik, ki v povezavi s tehnologijo opredeljuje postopke in naprave za ustvarjanje, shranjevanje in obdelavo dvojiško zapisanih podatkov. Takšno pojmovanje izraza se najpogosteje navezuje na računalnike in z njim povezano tehnologijo

informacijske družbe (*Information Society Technology - IST*).

Skladno s slednjo opredelitvijo lahko pojmujemo izraz digitalna kompetenca torej kot posameznikove značilnosti in veščine, ki se izražajo kot njegovo znanje, spretnosti, motivi, vrednote, prepričanja in vse drugo, kar potrebuje, da uspešno in učinkovito ter v skladu s standardi delovne uspešnosti in pričakovanji izvrši določeno nalogo ali opravi delo z IST.

Tako opredeljena kompetenca zajema temeljito poznavanje možnosti IST in razumevanje njene vloge v vsakdanjem zasebnem in socialnem življenju ter pri delu. Vključuje veščine za učinkovito in uspešno uporabo IST pri urejanju besedil, delu s razpredelnicami in podatkovnimi bazami, iskanju, shranjevanju, obdelavi in uporabi podatkov, razlikovanje med resničnimi in neresničnimi podatki, izdelavo učinkovitih predstavitev informacij na različnih medijih in njihovo razbiranje iz podatkov, komuniciranje in ne nazadnje poznavanje in zavedanje potencialnih nevarnosti te tehnologije. Digitalno kompetenten posameznik je z uporabo IST uspešnejši, ustvarjalnejši in inovativnejši, uporablja veljavne in zanesljive podatke ter se zaveda pravnih in etičnih načel uporabe te tehnologije.

5   Izgrajevanje digitalne kompetence

Izgrajevanje digitalne kompetence je zapletena in kompleksna dejavnost, ki se je ne da izvesti le s branjem knjig ali brskanjem po internetu. IST sama po sebi namreč nima strogo opredeljenega namena – z njo le obdelujemo podatke. Zato ni dovolj, če uporabnik tehnologijo uporablja in je računalniško pismen, ampak mora prednosti tehnologije učinkovito vključevati v svoje delo. Na tehnologijo mora, prenesti opravila, ki jih le-ta opravi bolje in učinkoviteje od njega, in se s tem na eni strani razbremeniti, hkrati pa na drugi strani kreativno in inovativno razmišljati o drugačnih, bolj učinkovitih rezultatih, ki brez IST ne bi bili dosegljiv niti mogoči.

Po mnenju Posebne skupine za opredelitev in razvoj digitalne kompetence v organizaciji IFIP TC3 (Special Interest Group on Digital Competence under IFIP TC3 – Education) in Strokovne skupine za digitalno kopetenco, ki jo je ustanovila in jo financira Evropska komisija z namenom, da opredeli koncept izgrajevanja digitalne kompetence v vrtcu in osnovni šoli (K-9), poteka izgrajevanje digitalne kompetence v štirih nivojih (Wechtersbach, 2007):

1. razvijanje, ko posameznik spoznava IST in razvija veščine za njihovo uporabo,
2. osmišljanje, ko posameznik pozna in razume prednosti IST ter jo uporablja pri svojem delu, pri čemer oblik, metod in rezultatov svojega dela večinoma ne spreminja,
3. širjenje, ko ima posameznik drugačne cilje, uporablja drugačne procese in dosega učinkovitejše in uspešnejše rezultate, ki brez IST ne bi bili mogoči,

A 3

4. intenzivna uporaba (mastery), ko uporablja IST za večanje svojih umskih zmogljivosti.

Po rezultatih raziskave e-learning Nordic 2006 je uporaba IST v izobraževalnih ustanovah v nordijskih državah (Danska, Norveška, Švedska in Finska) omejena predvsem na prvem in drugem nivoju, tretji je prisoten zelo redko in je praviloma odvisen od znanja in motiviranosti posameznega učitelja. Četrti nivo z raziskavo niso zaznali. Iz tega so sklepali, da so spremembe, ki so jih v izobraževanju povzročila IST zelo skromne. Še posebej glede na znatna sredstva, ki so bila porabljena v ta namen. Da je podobno tudi v Sloveniji, kažejo rezultati raziskave Ivana Gerliča (Gerlič, 2005).

6   Izgrajevanje digitalne kompetence pri predmetu Informatika

Razpršenost teorij posodabljanja učnih načrtov in uvajanja kompetenc v slovenski izobraževalni prostor gotovo ni olajšala. Uspešna implementacija konceptov je namreč mogoča le ob njihovem jasnem in nedvoumnem razumevanju. V Predmetni skupini za računalništvo in informatiko smo zato najprej opredelili kompetenco kot posameznikove značilnosti in veščine, ki se izražajo kot njegovo znanje, spretnosti, motivi, vrednote, prepričanja in vse drugo, kar učenec potrebuje za uspešno in učinkovito rešitev določenega informacijskega problema. V okviru svojih prizadevanj učenec, v skladu s kriteriji učne uspešnosti, izdela rešitev problema in pri tem izkaže določen učni dosežek.

Ko govorimo o kompetencah, si v predmetu Informatika torej vedno predstavljamo nek dosežek, ki je povezan z njimi. Med izpeljavo predmeta učenec pod mentorstvom učitelja rešuje avtentičen informacijski problem. Skladno s cilji, opredeljenimi v učnem načrtu, učitelj usmerja učenca v iskanju ustreznih rešitev, ga spodbuja k iskanju podatkov v različnih virih, njihovem vrednotenju in obdelavi ter mu svetuje pri oblikovanju rešitve. Pri tem se teorija poznavanja in razumevanja osnovnih zakonitosti informatike prepleta z metodami neposrednega iskanja, zbiranja, hranjenja, vrednotenja, obdelave in uporabe podatkov z namenom, da učenec izgrajuje svoje kompetence in jih v izdelani rešitvi izkaže kot svoj učni dosežek.

Pričakovani učni dosežek je v učnem načrtu opredeljen kot minimalni standard potreben za pozitivno oceno oziroma napredovanje učenca. Z višjimi ocenami je ovrednoten dosežek, ki presega ta pričakovanja. Kaj je potrebno storiti za višjo oceno in kako, je opredeljeno z opisnimi kriteriji po metodologiji EPIC (*Expresive, Productive, Innovative, Collaborative*) . (Hamilton, 2007) Pričakovani učni dosežek in opisni kriteriji za vrednotenje učenčevega dosežka so predstavljeni učencem že na začetku šolskega leta. S tem želimo učence motivirati za učinkovitejše izgrajevanje kompetenc in njihovo uspešnejše izkazovanje v učnih dosežkih.

7   Zaključek

Digitalna kompetenca ni znanje, ki bi ga bilo mogoče pridobiti »ex katedra«. Njeno izgrajevanje je proces, ki zahteva, da je učenec ves čas aktivno vključen v zastavljanje vprašanj, raziskovanje in iskanje odgovorov. Učni proces mora biti osredinjen na učenca, iskanje in odkrivanje novega je pravilo, srčika pa je reševanje problemov in kritično razmišljanje. (ACRL, 2000)

Pri tem se je potrebno zavedati, da izgrajevanje digitalne kompetence ni uspešno, če je izvzeto iz kurikula in potisnjen nekam v stran. Funkcionalno mora biti prisotno v vseh ciljih izobraževanja ter v kontekstu reševanja problemov v celotnem kurikulu. Posebej pa mora biti poskrbljeno za organizirano razvijanje digitalne kompetence, ki seveda ne more in ne sme biti omejeno zgolj na poznavanje računalniške strojne in programske opreme ter veščin njene uporabe, torej za razvijanje t.i. računalniške pismenosti. Zato je še kako pomemben predmet Informatika, ki sistematično izostri vsebinske povezave z IST.

Takšno izgrajevanje digitalne kompetence omogoča izpeljavo različnih oblik na učenca osredinjenega učnega procesa, npr. sodelovalno učenje in poučevanje ter problemsko in raziskovalno učenje. Pri takšnem izobraževanju so učenci bolj aktivni in jih zato učni proces bolj pritegne kot učenje s transmisijskim posredovanjem podatkov. V njem učenci več razmišljajo in postanejo soodgovorni za svoje napredovanje (MSACHE, 2003).

Seveda pa zahteva takšno poučevanje večji napor, večjo zavzetost, več časa in znanja učiteljev. Zato je seveda na mestu vprašanje, ki si ga učitelji pogosto zastavljajo: »Zakaj vse to?« A odgovor morajo poiskati med učenci.

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Rado Wechtersbach je magister organizacijskih znanosti. Zaposlen je na Zavodu RS za šolstvo v Ljubljani kot vodja predmetne skupine za računalništvo in informatiko. Je vodja Predmetne razvojne komisije za prenovo izbirnega predmeta Računalništvo v osnovni šoli in predmeta Informatika v gimnazijskih programih, tajnik Republiške maturitetne komisije za splošno maturo iz Informatke, zunanji ekspert Posebne skupine za opredelitev in razvoj digitalne kompetence, avtor več učbenikov za izbirni predmet Računalništvo v osnovni šoli in Informatika v srednji šoli, avtor prek 20 strokovnih knjig in prek 50 strokovnih člankov ter prispevkov s področja vpeljevanja in uporabe IST v izobraževanju.

Izobraževalni model v skladu z Lizbonsko strategijo v javni upravi

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Prispevek obravnava področje vseživljenjskega izobraževanja odraslih, ki je s tako imenovano Lizbonsko strategijo v letu 2000 končno pridobilo ustrezno mesto v izobraževalnem sistemu. Z raziskavo o vključenosti v vseživljenjsko izobraževanje smo želeli pridobiti informacije o motivaciji, o ovirah in potrebah, ki spremljajo odrasle zaposlene pri vključevanju v izobraževanje. Ugotovili smo, da se zaposleni manj vključujejo v formalno izobraževanje zaradi finančnih razlogov, prevelike zaposlenosti in obremenjenosti s službenimi in družinskimi obveznostmi. Se pa pogosteje vključujejo v krajše oblike neformalnega izobraževanja in usposabljanja, ki ga v večini financira delodajalec in poteka v okviru delovnega časa. Zaposleni največkrat čutijo potrebe po izobraževanju na strokovnem področju, tujih jezikih in informacijski tehnologiji. Z oblikovanjem modela želimo omogočiti zaposlenim pridobitev osnovnih veščin, ki jih je Lizbonska strategija označila kot ključne v gospodarstvu, ki temelji na znanju.

Ključne besede: vseživljenjsko učenje, lizbonska strategija, zaposleni, izobraževalni model

1 Uvod

Znanje, pridobljeno v formalnem izobraževanju, nam ne zadošča več, da bi lahko enakopravno in učinkovito opravljali svoje delo, se prilagajali spremenjenemu delovnemu in tudi širšemu ekonomskemu okolju. Spremembe v organizaciji dela in vodenju so povzročile, da so se v delovnih organizacijah začeli zavedati pomena dobro izobraženih kadrov in so več časa in denarja začeli vlagati v izobraževanje in usposabljanje delavcev. Temelj nenehnega razvoja posameznika in organizacije je ciljno usmerjeno, sistematično in stalno usposabljanje vseh zaposlenih (Vukovič in Miglič, 2006).

Delavec bo uspešen in učinkovit, če bo ustrezno usposobljen in izobražen. Znanje zaposlenih, ki ni strukturirano in primerljivo z znanjem ter sposobnostmi ostalih zaposlenih, ne moremo izmeriti, ustrezno nagraditi ter ga nadgrajevati. Uporaba informacijske tehnologije, nenehno prilagajanje znanj, spretnosti, in sposobnosti je v vsakem delovnem procesu nujnost, vse bolj pa prodira tudi v domače okolje. Prilagajanje, sprejemanje novih izzivov in odprtost za nove informacije so edine možnosti za preživetje na sedanjem trgu delovne sile. Če citiramo Alvina Tofflerja: »analfabet prihodnosti ne bo tisti, ki ne bo znal brati, temveč tisti, ki se ne bo znal učiti« (Jelenc, 1996).

Učeča se družba ima vpliv na posameznika, delovanje organizacije ter nenazadnje na celotno družbo. V družbi, ki temelji na znanju, imajo tisti z najmanj sposobnostmi in najslabšimi možnostmi za učenje najmanj možnosti za pridobitev plačane zaposlitve ter ohranjanja le te. Zato je ideja Yeaxlee-a iz leta 1929 (Smith, 1996, 2001), da naj bi se učenje skozi celotno življenje spodbujalo, osnovnega in temeljnega pomena. Učenje posameznikom omogoča rast in razvoj (Jarvis, 1993).

V članku predstavljamo izobraževanje delavcev v Zavodu RS za zaposlovanje. Zavod je že pred leti pripravil koncept »Razvoj kadrov v ZRSZ (2000)«. V ključnem dokumentu so zapisali, da je vse odvisno od ljudi, od zaposlenih, od njihovih virov – znanja, motiviranosti, izkustev, ustvarjalnosti in še bi lahko naštevali. Edina neizkoriščena notranja rezerva so neizkoriščena znanja, strokovna usposobljenost in izkušnje zaposlenih – torej v človeških virih. Zaradi pomanjkanja finančnih virov projekt ni nikoli zaživel v celoti. Zato smo pripravili nov model, ki bo temeljil na sodobnih temeljih lizbonske strategije in Memoranduma o vseživljenjskem učenju in bo uporaben za različne poklicne skupine v okviru javne uprave.

2 Lizbonska strategija vseživljenjskega učenja

Tako imenovana Lizbonska strategija je nastala na zasedanju Evropskega sveta v Lizboni med 23 in 24 marcem leta 2000. Z upoštevanjem razmer in zmožnosti so postavili nove strateške cilje za Evropsko unijo z namenom izboljšati zaposlovanje, izvesti ekonomske reforme in

izboljšati socialno kohezijo na znanju temelječe ekonomije (http://www.ec.europa.eu/).

Evropska Unija si je zadala nov strateški cilj za naslednji deset let: »**Postati najbolj konkurenčno in dinamično, na znanju zasnovano, gospodarstvo na svetu, sposobno trajnostne gospodarske rasti z več in boljšimi delovnimi mesti ter večjo socialno kohezijo**« (http://www.ec.europa.eu/).

Ljudje so glavni vir razvoja in morajo postati osnovni vodilo politike Unije. Vlaganje v ljudi in razvoj aktivnega in dinamičnega stanja blagostanja bo odločilnega pomena za področje Evrope v ekonomiji, ki temelji na znanju, zato je potrebno razviti mehanizme, ki bodo premagali obstoječe socialne probleme, brezposelnost, socialno izključenost in revščino. Izpostavili so nekaj ključnih predpostavk, iz katerih so se kasneje razvili drugi dokumenti, naj omenimo samo Memorandum o vseživljenjskem učenju, Izobraževanje in usposabljanje 2010, nacionalne strategije vseživljenjskega učenja in še bi lahko naštevali.

Evropski izobraževalni sistem in sistem usposabljanja mora usvojiti nove zahteve na znanju temelječe družbe. Prav tako je potrebno izboljšati raven in kvaliteto zaposlovanja. Potrebno je ponuditi možnosti za izobraževanje in usposabljanje, ki bo prilagojeno posameznim ciljnim skupinam v različnih življenjskih obdobjih. Evropski okvir vseživljenjskega učenja zajema: znanje informacijske tehnologije, osnova znanja tujih jezikov, tehnološka kultura, socialne veščine ter spodbujanje podjetništva in povzemanje iniciative.

Vseživljenjsko izobraževanje je bistveno za razvoj aktivne državljanske vloge, socialne vključenosti in zaposlovanja. Države članice naj bi oblikovale strategije in praktične rešitve z upoštevanjem vseživljenjskega izobraževanja za vse, promoviranjem vključenosti vseh socialnih partnerjev, vseh potencialnih virov financiranja ter omogočanjem zvišanja izobrazbene ravni čim večjemu številu prebivalstva v okviru strategije vseživljenjskega izobraževanja.

V naslednjih letih so se prednostne naloge dopolnjevale glede na zastavljene in dosežene cilje. Izboljšanje osnovnih spretnosti, še posebej spretnosti upravljanja z informacijsko tehnologijo in digitalno pismenostjo, je najpomembnejša prednostna naloga, ki naj bi omogočala Uniji, da postane konkurenčna in dinamična na znanju temelječa družba.

Na znanju temelječa ekonomija potrebuje dobro osnovno izobraževanje, če naj podpre mobilnost delovnega trga in vseživljenjskega učenja. Posebno pozornost je potrebno posvetiti mladim, ženskam in jih usmerjati v tehnične in znanstvene študije. Primerljivost znanja in čas študija, diplome, certifikatni sistem, evropski CV – vse to so naloge, ki jih države članice vpeljujejo v izobraževalni sistem z uvajanjem tako imenovanega Bolonjskega načina visokošolskega študija.

3   Metodologija

Vprašalnik smo povzeli po ACS – ovi raziskavi o spremljanju doseganja strateških ciljev izobraževanja odraslih do leta 2006: preučevanje vzorcev izobraževanja odraslih (Mohorič Špolar in avtorji, 2005). V raziskavo smo vključili 10% vseh zaposlenih. Glede na to, da je na ZRSZ največ zaposlenih z VI. oz. VII. stopnjo izobrazbe, smo pri izbiri vzorca tej skupini namenili največ »mest«.

Prvi del vprašalnika je bil namenjen pridobivanju osnovnih informacij o posamezniku. V tem delu vprašalnika smo želeli pridobiti informacije o spolu, starosti, delovni dobi, statusu delovne pogodbe, delovnem mestu, delovnem področju in nivoju managementa. Osrednji del vprašalnika je namenjen formalnemu in neformalnemu izobraževanju / usposabljanju. Vprašanja so bila postavljena tako, da je anketiranec odgovarjal o izobraževanju v preteklem letu oz. šolskem letu. Prav tako so nas zanimale ovire, ki so anketirancem onemogočale vključitev v eno ali drugo obliko.

Zadnji del vprašalnika pa je bil namenjen pridobivanju informacij o potrebah po izobraževanju na posameznem izobraževalnem področju. Ta del vprašalnika je bil pomemben za pripravo modela za izobraževanje zaposlenih v javni upravi.

Vprašanja so bila postavljena tako, da je anketiranec odgovarjal po 5 – stopenjski Likertovi lestvici pomembnosti posameznega dejavnika (1 pomeni nepomemben do 5, ki pomeni zelo pomemben).

Anketiranci so odgovarjali na vprašanja razlogih za vključitev bodisi v formalno bodisi v neformalno izobraževanje (tabela 1) oz. ovirah (tabela 2).

Tabela 1: Razlogi za vključitev v formalno ali neformalno izobraževanje

VEČJA UVELJAVITEV
USPEŠNOST PRI DELU
VEČJA STROKOVNOST
NAPREDOVANJE
OBDRŽATI ZAPOSLITEV, DELOVNO MESTO
MENJAVA DELOVNEGA MESTA, DELOVNEGA PODROČJA
ZAHTEVA DELODAJALCA
ŽELJA, VESELJE DO UČENJA
DRUŽABNI STIKI

Tabela 2: Ovire pri vključevanju v formalno ali neformalno izobraževanje

PREVELIKA ZAPOSLENOST
NEUSTREZNA PONUDBA
PREZAHTEVEN PROGRAM
IZOBRAŽEVANJE JE BILO PREDRAGO
DRUŽINSKE OBVEZNOSTI
ZDRAVSTVENI RAZLOGI

4   Rezultati raziskave

Na Zavodu je bilo v mesecu aprilu 2007 (ko smo izvajali anketo) zaposlenih 865 oseb. Anketni vprašalnik smo skupaj s kadrovsko službo posredovali 240 osebam. Ankete so bile vrnjene po elektronski pošti oz. z »navadno« pošto.

Vrnjenih smo dobili 114 vprašalnikov, ki predstavljajo 13,2% vseh zaposlenih.

Na anketo je odgovorilo 10,5% moških in 89,5% žensk. Vzorec odgovorov se ujema tudi s stanjem zaposlenih moških na ZRSZ, ki predstavljajo 11% vseh zaposlenih. Na anketo je odgovorilo največ oseb, starih med 31 in 40 let in sicer kar 44,7%, druga pomembna skupina je stara med 41 in 50 let – 34,2%, sledita pa še starostni skupini starejši od 50 let z 12,3% ter najmlajši stari od 20 do 30 let z 8,8%. Najmlajša anketirana oseba je stara 26 let, najstarejša pa 60, povprečna starost je 41,14 let. Stopnja izobrazbe ustreza delovnemu mestu, tako osebe s srednješolsko izobrazbo (32,5%) opravljajo dela strokovnega referenta (32,5%), osebe z višješolsko izobrazbo (21,1%) opravljajo večinoma dela svetovalca (24,6%), medtem ko osebe s sedmo ali osmo stopnjo opravljajo dela samostojnega svetovalca, koordinatorja delovnega področja, svetovalca generalnega direktorja, so vodje programa, projekta oz. vodje služb.

Motivi za vključitev v formalno oz. neformalno izobraževanje

V formalno izobraževanje je bilo v šol. letu 2006/2007 vključenih 14,03% anketiranih. Kot pomembne oz. najpomembnejše razloge za vključitev v formalno izobraževanje ocenjujejo željo po večji strokovnosti in uspešnosti pri delu ter želji in veselju do učenja. Razpršenost med odgovori je majhna in pomeni, da se anketirani med seboj strinjajo o pomembnosti posameznih zgoraj naštetih razlogov.

Za vključitev v formalno izobraževanje kot manj pomemben razlog ocenjujejo zahtevo delodajalca, med anketiranci obstajajo razlike, vsaj eden anketiranec ocenjuje zahtevo delodajalca kot zelo pomembno in vsaj eden kot nepomemben razlog. Kot srednje pomembno sta ocenjena naslednja razloga za vključitev v formalno izobraževanje: večja uveljavitev v družb in menjava delovnega mesta.

Tabela 3: Razlogi za vključitev v formalno oz. neformalno izobraževanje

	Formalno izobraževanje			Neformalno izobraževanje		
	N	povprečje	standardni odklon	N	povprečje	standardni odklon
Večja uveljavitev v družbi	16	2,94	1,124	79	1,99	0,92
Uspešnost pri delu	16	4,13	1,147	79	4,32	0,97
Večja strokovnost	16	4,44	0,729	79	4,48	0,81
Napredovanje	16	4	1,155	79	2,54	1,29
Obdržati zaposlitev, delovno mesto	16	3,25	1,291	79	2,71	1,35
Menjava delovnega mesta	16	3,63	1,258	79	2,14	1,22
Zahteve delodajalca	16	2,5	1,211	79	3,47	1,4
Želja, veselje do učenja	16	4,19	0,981	79	4,29	1,08
Družabni stiki	16	3,25	1,39	79	2,92	1,36

Pri neformalnem izobraževanju pa gre za krajše oblike izobraževanja in so bile določene osebe vključene v več programov. V samo en program je bilo vključenih 57 anketiranih oseb oz. 50%, v dva programa je bilo vključenih 16 oseb (14,03%) ter 6 oseb ali 5,26% anketiranih v tri ali več programov. Med razlogi za vključitev v neformalno izobraževanje ocenjujejo večjo strokovnost, uspešnost pri delu ter nenazadnje tudi željo in veselje do učenja za zelo pomembno. Razlike med odgovori na ta vprašanja so najmanjše in lahko rečemo, da se o pomembnosti le teh razlogov anketiranci strinjajo. Večje razlike pa so pri drugih odgovorih, kjer vsaj en anketiranec ocenjuje, da je določen razlog nepomemben ter vsaj en, ki meni, da je določen razlog zanj zelo pomemben. Kot pomemben razlog anketiranci ocenjujejo zahtevo delodajalca ter dru-

žabne stike, vsi ostali razlogi pa so za anketirance manj pomembni oziroma nepomembni (tabela 3).

Ovire

Ker je bilo med anketiranimi kar 86% tistih, ki se v preteklem letu formalnega izobraževanja niso udeležili, je zanimivo pogledati razloge za ne udeležitev. V tabeli 4 predstavljamo ovire pri vključevanju v formalno izobraževanje. Kot srednje pomemben razlog anketiranci ocenjujejo predrago izobraževanje, družinske obveznosti ter preveliko zaposlenost. Kot nepomemben oz. manj pomemben razlog pa ocenjujejo prezahtevnost programa in zdravstvene razloge. Odgovori se med anketiranci precej razlikujejo, kot je razvidno iz tabele – standardni odklon. V splošnem lahko rečemo, da so anketiranci zado-

voljni z doseženo stopnjo izobrazbe in nimajo potrebe po višji stopnji izobrazbe.

Med anketiranci, ki se niso udeležili nobene oblike usposabljanja ali neformalnega izobraževanja, so razloge za ne vključitev ocenjevali takole: kot pomemben razlog ocenjujejo preveliko zaposlenost in predrago izobraževa-nje, vse ostale razloge pa v povprečju ocenjujejo kot manj pomembne oz nepomembne. Kot nepomemben razlog izstopa mnenje o zahtevnosti programa, zdravstveni razlo-gi, kot manj pomembne razloge pa ocenjujejo neustrezno ponudbo in družinske obveznosti.

Tabela 4: Ovire pri vključevanju v formalno oz. neformalno izobraževanje

	Formalno izobraževanje			Neformalno izobraževanje		
	N	povprečje	standardni odklon	N	povprečje	standardni odklon
Prevelika zaposlenost	96	3,21	1,414	53	3,04	1,454
Neustrezna ponudba	94	2,37	1,244	54	2,13	1,332
Prezahteven program	94	1,74	0,829	53	1,53	0,799
Izobraževanje je predrago	94	3,16	1,582	53	2,74	1,654
Družinske obveznosti	94	3,06	1,494	53	2,30	1,381
Zdravstveni razlogi	94	1,72	1,121	54	1,65	1,184

Želje in potrebe

V prihodnje bi se v neformalno izobraževanje želelo vključiti 55 anketiranih. Zaradi raznovrstnosti odgovorov smo odgovore anketirancev razvrstili v šest kategorij in sicer: računalniški tečaji, komunikacija in intervju, tuji jeziki, strokovni seminarji, psihosocialna znanja ter mar-ketinška znanja in veščine, ki jih predstavljamo v grafu 1. Kar 40,0% vprašanih se želi izpopolnjevati na različnih strokovnih seminarjih, petina izpopolniti svoje znanje tujih jezikov ter 14,5% različna računalniška znanja. Zani-manja za ostala področja izpopolnjevanja je manj kot 10,0%. Razumljivo je, da se anketiranci želijo vključiti v različna strokovna izobraževanja, saj želijo svojo strokov-nost še izboljšati in spremljati novosti.

5   Izobraževalni model

Namen modela je oblikovati program izobraževanj, ki vključuje različne vsebine, prilagojene posameznim nivo-jem managementa, obenem pa omogočiti spreminjanje glede na razvoj in potrebe trga dela. Namen modela je urediti izobraževanje v smiselno celoto in ga v skladu z Operativnim programom Razvoj človeških virov (2007) vključiti v Modernizacijo Zavoda.

Cilji izobraževalnega modela:
- vsebinsko in organizacijsko prilagajanje aktivnosti in managementa zahtevam vse bolj dinamičnega trga dela;
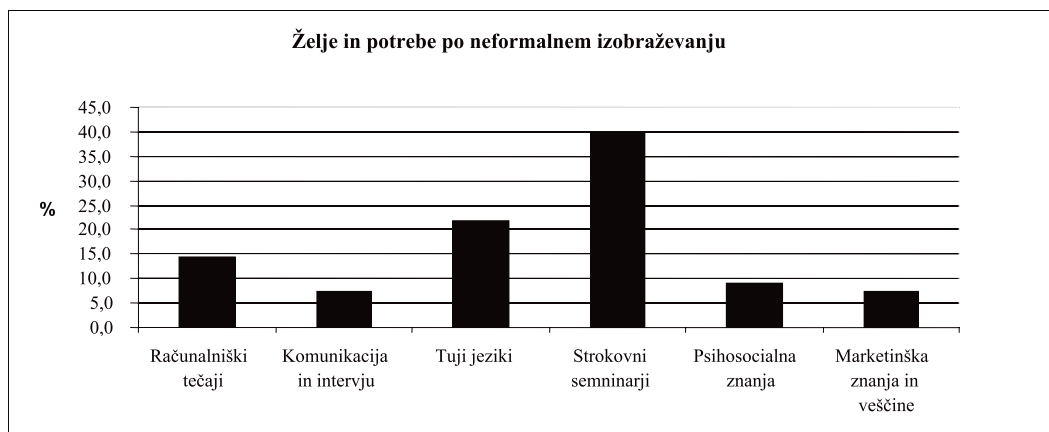
Graf 1: Želje in potrebe po neformalnem izobraževanju

■ zagotoviti sistem izobraževanja in usposabljanja na načelih vseživljenjskega učenja, ki s poglabljanjem splošne izobrazbe in razvijanjem poklicnih ter strokovnih kompetenc omogoča stalno osebno in poklicno rast;

■ vključevanje ključnih kvalifikacij v izobraževalne programe, posebej na informacijsko-komunikacijskem področju, v podjetništvu, aktivnem zaposlovanju, vodenju, ipd.;

■ oblikovanje predlogov sistemskih, organizacijskih in normativnih sprememb, potrebnih, da model zaživi v praksi.

Model smo oblikovali glede na obliko izobraževanja – formalno oz. neformalno izobraževanje, izvajanje – notranja usposabljanja oz. zunanja usposabljanja ter nenazadnje vsebine, ki smo jih razdelili glede na temeljne veščine, ki naj bi jih vsakdo obvladoval – znanje informacijske tehnologije, osnovna znanja tujih jezikov, tehnološka kultura, socialne veščine ter spodbujanje podjetništva in povzemanje iniciative.

Vsem delavcem, ki si želijo zvišati svojo izobrazbeno raven je potrebno omogočiti nadaljnje izobraževanje. Glede na finančne omejitve ZRSZ za področje izobraževanja je potrebno zaposlenim omogočiti tudi drugačne spodbude za vključitev v formalno izobraževanje in sicer v obliki dodatnih študijskih dopustih, omogočiti možnosti za samoizobraževanje v okviru ZRSZ – središče za samoizobraževanje (študijski kotiček, dostop do elektronskih medijev, dobro založena knjižnica), mentorstva, inštrukcije, konzultacije, usposabljanje na delovnem mestu, ipd.

Notranje oblike izobraževanja pa bi morale temeljiti na treh sklopih: priprava na strokovni izpit, ki je obvezujoč za vse delavce Zavoda, drugi sklop se mora nanašati na pridobivanje tako imenovanih »mehkih« znanj, ki zaposlenim omogočajo, da postanejo dobri svetovalci in se na primeren način soočajo s težavami na delovnem mestu ter tretji sklop izobraževanj, ki se nanaša na pridobivanje znanj s področja učinkovite uporabe informacijske tehnologije, revizorstva, kontrole in nadzora, učinkovite porabe sredstev iz Evropskega socialnega sklada in podobno.

Le te oblike izobraževanja, ki se nanašajo na pridobivanje neformalnega znanja, bi morale postati dostopne za večji krog zaposlenih. ZRSZ zaposluje širok krog strokovnjakov iz različnih področij. Z oblikovanjem kroga predavateljev – strokovnjakov s posameznih področij, bi lahko omogočili širši prenos znanja. Potencialne predavatelje bi bilo potrebno usposobiti za pedagoško andragoško delo in jim omogočiti pridobitev znanja iz psihologije odraslih, metod in oblik izobraževanja odraslih, etike, animacije ter metod svetovalnega dela. V skladu z razvojem kulture vseživljenjskega učenja bi posameznikom omogočili pridobitev raznovrstnih znanj ter motivacijo za nadaljnje usposabljanje in izobraževanje.

Za področja, kot so znanje tujih jezikov, posebna področja informacijske tehnologije, vodenja in marketinga ter druga strokovna izobraževanja pa bi bilo potrebno izbrati ustrezne zunanje izobraževalne institucije, ki bi omogočile pridobitev znanj zaposlenim na posameznem strokovnem področju.

6   Zaključek

Kultura vseživljenjskega učenja je z Lizbonsko strategijo dobila ustrezno mesto. Znanje, pridobljeno v formalnem izobraževanju, nam ne zadošča več, da bi lahko enakopravno in učinkovito konkurirali na evropskem trgu dela. Spreminjajoče se delovno okolje, inovacije v tehnologiji, prilagajanje in zahteve po novih veščinah, spretnostih in znanju so postale stalnice v vsakodnevnem življenju. Zahteve po vseživljenjskem učenju so postale potrebe in nuja za preživetje.

Raziskava je pokazala, da se zaposleni manj vključujejo v formalno izobraževanje predvsem zaradi finančnih obremenitev, prevelike zaposlenosti in družinskih obveznosti. Z izboljšanjem pogojev za študij, bi se v formalno izobraževanje mogoče vključilo več zaposlenih. Prav vključenost v neformalno izobraževanje kaže, da se zaposleni radi vključujejo v izobraževanje, saj jim nova znanja omogočajo večjo strokovnost in večjo uspešnost pri delu. Največ potreb po izobraževanju imajo na strokovnem področju, znanju tujih jezikov ter informacijske tehnologije.

Z razvojem izobraževalne dejavnosti in oblikovanjem modela bomo prispevali k boljši usposobljenosti zaposlenih, ustreznemu poklicnemu in osebnostnemu razvoju ter nenazadnje k razvoju kulture vseživljenjskega učenja.

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Obremenitev in motivacija študentov pri spletno podprtem izobraževanju

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Prispevek predstavlja in preizprašuje problematiko obremenitve študenta in z njo povezane učne motivacije, še posebej v kontekstu najnovejših, t. i. Bolonjskih prenov študijskih programov. Pri tem se posebej osredotoča na spletno podprto, kombinirano izobraževanje. Skozi primerjavo treh istočasnih kombiniranih izvedb predmeta „Multimediji" na treh različnih slovenskih višjih strokovnih šolah, ter opis izbranih dobrih praks, so podana priporočila za prihodnostno naravnano, aktivno rabo novih IKT v izobraževanju – od kurikularno-razvojnih vidikov, preko kombiniranih oblik procesov ocenjevanja in zagotavljanja kakovosti, do didaktičnih metod, npr. rabe forumov, wiki-jev, online gradiv in virov (tudi multimedijskih) ter drugih e-izobraževalnih oblik. Z vidika zmanjševanja obremenitve tako učitelja kot študentov ter hkratnega povečevanja učnega učinka oziroma zviševanja učne motivacije so tako podani prvi obrisi interaktivnega razbremenitvenega modela kombiniranega izobraževanja.

Ključne besede: obremenitev, dejanska, motivacija, učni učinek, e-izbraževanje, kombinirano, praksa

1   Dejanska obremenitev študenta

V sodobni družbi se vse bolj uveljavlja vrednota posameznikovega (ali skupinskega) nadzora nad viri, poleg materialnih in finančnih velja to predvsem za **čas** – ki se ga pregovorno izenačuje z denarjem (le-ta pa, spet pregovorno, naj bi vladal svetu). Čas naj bi nasploh veljal za enakomerno razsežnost, opredeljeno z zanesljivimi fizikalnimi merskimi enotami. Enakomeren potek časa je spremenljiv zgolj z vidika posameznikovega (ali skupinskega) doživljanja oziroma motivacije (kot npr. v pojmih »*dolg*čas« ali »*kratko*časje«).

Zato je sprotno preverjanje t. i. **dejanske obremenitve študentov** praviloma pomembno predvsem pri uvedbah novih študijskih programov, in še posebej ob prenovah obstoječih, poleg področja visokega šolstva pa se širi tudi na nižje stopnje izobraževalne lestvice. Prav pri kurikularnih prenovah gre nedvomno za pomembno **spreminjanje in prenovo kolektivnih oziroma individualnih procesov osebnostne oziroma izobrazbene rasti**. Intenzivnejše spremljanje obremenitve naj bi se v skladu z Bolonjsko deklaracijo – v slovenskem prostoru torej v zadnjih nekaj letih – izvajalo vse do zaključka študija prve generacije, potem pa sprotno v letnih ali največ dvoletnih intervalih izvedbe novega ali prenovljenega študijskega programa. V obremenitev študenta tako štejejo »*predavanja, seminarji, vaje in druge oblike organiziranega študijskega dela (praktično usposabljanje, hospitacije, nastopi, terensko delo ipd.), individualno študijsko delo (sprotno delo, študij literature, seminarske naloge, projektno delo, raziskovalno delo), priprava na izpite ali druge oblike preverjanja*

ter diplomska (magistrska, doktorska) naloga« (MVZT 2006).

Pri tovrstnem merjenju gre v praksi pogosto za metodo samoocenjevanja študentov oziroma učencev o »dejanski« (torej ne zgolj kurikularno načrtovani) skupni obremenitvi preko **anketiranja,** ali tudi bolj poglobljeno s **pogovori, intervjuji.** Posebnega pomena je tudi **sodelovanje s predstavniki študentov** oziroma učencev glede na organiziranost izvedbe posameznega programa, dobra (a izvedbeno zahtevnejša) metoda so t. i. **fokusne skupine.** Seveda je v trikotnik zagotavljanja kakovosti izobraževalnega procesa poleg učencev **potrebno vključevati tudi učitelje,** nenazadnje pa tudi vodstvo šole – ne zgolj v smislu možnih ukrepov, temveč tudi v smislu sočasnega merjenja delovne obremenitve drugih dveh »oglov« izobraževalnega trikotnika, torej predvsem učiteljev, in nenazadnje tudi vodstva samega.

Ne le prvoosebne izkušnje, temveč tudi številne kvantitativno obsežne raziskave obremenitev študentov – tako v tradicionalnih kontaktnih, kot v e-izobraževalnih, kombiniranih in daljinskih načinih – se značilno ujemajo v končnem spoznanju, *da je študentova kvantitativna samoocena glede obremenitve s študijskim delom (oz. celotnim študijskim procesom) še zmeraj subjektivna do te mere, da se nanjo ne moremo zares zanesljivo opreti pri načrtovanju in izvedbi predmeta, ter njeni prenovi.* Zaznavanje oziroma »občutenje« dolžine preteženega časa je namreč močno podvrženo **motivacijskim dejavnikom,** ki izhajajo iz uporabljenih **metod poučevanja ali oblike in vsebine učnih gradiv,** pomembna sta predvsem njihova **zahtevnost in način preverjanja znanja,** nadvse velik vpliv na oceno obremenitve pa naj bi imel prav **odnos med učiteljem**

in študenti, oziroma znotraj študentske skupine ali skupnosti. Močan vporedni vpliv nenazadnje izkazujejo tudi sami **študijski programi in iz njih izpeljani učni načrti**, ki globinsko krmilijo vse zgoraj omenjene dejavnike (Kember 2004). Zato pričujoči prispevek ob bok uvodnim kvantitativnim merjenjem pomembno pristavlja prvoosebne in kvalitativno pridobljene podatke, bodisi iz odprtih delov študentskih anket, bodisi iz pol- in neformalnih pogovorov s študenti samimi, ter s kolegi soizvajalci.

1.2 Merjenje občutene dejanske obremenitve

Pri merjenju dejanske obrementve študenta o(b)staja pomembna **težava segmentacije obremenitve** (torej natanko KAJ je tisto, kar študenta natanko KOLIKO obremenjuje), pridružuje pa se ji tudi **problem samoopazovanja študentov** nasploh – še posebej če razumemo študenta kot vseživljenjsko učečega se posameznika, ki se (postopoma vse bolj) zaveda lastnega izobraževalnega procesa, in ga tudi aktivno (so)uravnava. Pri merjenju obremenjenosti je pomemben hiter in kakovosten odziv učitelja – oziroma »merilca«, torej osebe s kompetenco nadzora oziroma izboljševanja kakovosti, npr. v imenu vodstva šole, redkeje zunanjega evalvacijskega sistema – najbolje v obliki poglobljenega pogovora s študenti. Formalno gre tu predvsem za institut **študentskega predstavništva** v telesih izobraževalne institucije oziroma programa (a le pod pogojem doslednega izvajanja), neformalno pa za različne (odprtejše) **oblike pogovorov**, od tistih bežnih in spontanih (a v zadostnem obsegu nič manj merodajnih) »po pouku«, do bolj strukturiranih, moderiranih »razrednih ur« ipd. V obeh primerih tudi ne gre podcenjevati komunikacijskih oziroma e-participacijskih možnosti IKT kot npr. (odprti in predvsem zaprti ter tudi neodvisni) forumi, klepetalnice ter različne (ustrezno instrumentalizirane) oblike socialnega mreženja v smislu Spleta 2.0.Nadaljnjo pomembno možnost predstavlja tudi sprotno kvantitativno merjenje posameznih učnih aktivnosti med samim potekom predmeta, torej nekakšno samoopazovalno preštevanje ur, ki jih je študent porabil za določeno (pod)aktivnost. Vendar pa taka metoda le **stežka zajame vse različne dejavnosti študenta** v zvezi z določenim predmetom oziroma obdelano snovjo ter mnogoterimi učnimi procesi (npr. med vzporedno ali zaporedno obdelanimi predmeti oziroma snovmi, siceršnjimi delovnimi ali življenjskimi izkušnjami itd.). Lahko pa povzroči tudi preveliko osredotočenost študenta zgolj na merjene (kurikularno oziroma izvedbeno načrtovane) dejavnosti, ki s tem zasenčijo vse tiste, katere študent opravlja dodatno, spontano, samoiniciativno, celo izvenzvestno. Pri tem je pomembno tudi, da zelo verjetno **ni statistično značilne povezave med ocenami in obremenitvijo študentov** – študentje ki za študij porabijo več časa, (samo) zaradi tega torej ne dobivajo višjih ocen (Lesjak in Sulčič, 2007:60).

Točnost merjenja in objektivnost rezultatov dodatno zapleta močan **učinek osebne učne motivacije**, pod vplivom katere lahko študent oceni (»občuti«), da je npr. delal manj (pozitivna motivacija oziroma naravnanost do predmeta) ali nemara več (negativna) od »dejansko«

opravljenega dela, tako opredeljenega zgolj z objektivno merljivimi porabljenimi časovnimi resursi. Po vsesplošnem prepričanju pri višji individualni učni motivaciji študent učne cilje dosega z manj truda in v krajšem času kot v primeru nižje učne motivacije (subjektivno ocenjeni čas pa ob takem študiju »hitreje mine«). Občutek »obremenitve« – in ne gre pozabiti, da ima pojem v širši družbeni rabi pretežno negativno konotacijo – je odvisen tudi od zadovoljstva študentov s samim predmetom, **kolektivne študijske oz. učne klime** v učni skupini, medosebnih odnosov in drugih kompleksnih (navadno le kvalitativno merljivih) dejavnikov. Iz tega razloga je pomembno, da pri ocenjevanju in uravnavanju obremenitve študentov dosledno upoštevamo tudi uporabljane učne metode (njihovo specifično kombinacijo) in predvsem kvalitativne odzive študetov (npr. odgovori na odprta vprašanja kot npr. »Ali bi nam želeli sporočiti še kaj?« ipd.).

Nenazadnje so pomembne tudi **dosedanje individualne** (ali mikro-skupinske) **učne izkušnje študenta**, tako na nivoju (npr. strokovno profiliranega) predmeta kakor na nivoju programa, torej »v šoli«, in pri (npr. medprogramskem, interdisciplinarnem ipd.) študiju nasploh: delovna etika, naravnanost do didaktične metode oziroma načina izvedbe, zmožnost obvladovanja kompleksnih, vzporednih delovnih procesov (ki seveda zmanjšuje »dejanski« čas, potreben za doseganje posameznega učnega cilja) itd.

2 Splet kot merilo in uravnilovka obremenitev

Internet je v zadnjih dveh desetletjih močno približal različne konce sveta, ob uporabi osebnega računalnika (tudi v navezavi z mobilnimi napravami, digitalno televizijo itd.) se je čas posredovanja in obdelave informacij »občutno« skrajšal. Ali informacijsko-komunikacijske tehnologije človeka torej vendarle razbremenjujejo? In če da, *kako lahko nove tehnologije* – kot npr. (v svoji nedvomno že osrednji in še naprej naraščajoči izobraževalni vlogi) svetovni splet, seveda v navezavi z multimedijskim osebnim računalnikom in drugimi IKT – *po eni strani pripomorejo h kakovostnemu, vsestransko uravnovešenemu merjenju oziroma nadziranju dejanske obremenitve študentov, po drugi pa celo stimulirajo višjo in hkrati manj (kot negativno) zaznavno študijsko obremenjenost?*
V pričujočem prispevku zavzemamo stališče, da lahko v zgoraj orisanih dilemah ocenjevanja obremenitve študentov, in njenega uravnavanja, neposredno koristijo prav družbeni, tako kulturni kot tehnološki trendi **rabe novih medijev, še posebej spleta in osebnega računalnika** – vse bolj tudi v mnogih mobilnih in multilokacijskih oblikah, izpeljankah in hibridih. Razmah uporabe spleta ter njegovo prežemanje vse več področij človekovega dela in komunikacije, javnosti in zasebnosti, govori v prid njegovi aktivni – in zato seveda toliko previdnejši – uporabi v izobraževanju. Spletno okolje je pri tem pomembno tako v smislu vira (bolj ali manj kakovostnih, nadziranih, filtriranih itd.) informacij kot tudi same izobraževalno-

komunikacijske (nenazadnje tudi ocenjevalne, merilne, arhivske itd.) platforme. Ob tehnično zagotovljeni (v spodnjem primeru tudi ustrezno demonstrirani) **anonimnosti zajemanja, obdelave in hranjenja podatkov** je lahko (šolsko-intranetna) spletna anketa zelo učinkovito orodje za zaznavanje dejanske študijske obremenjenosti. In kakor velja tudi za uravnavanje le-te, *splet ni in ne more biti edino sredstvo rešitve iz sodobnega obremenitvenega paradoksa* (po tržnem principu »več-izplena-za-manjvložka«), *lahko pa ključno pripomore* – kar skušamo ilustrirati v naslednjem poglavju.

Zadnja dostopna spletna raziskava o ekonomskem, socialnem, bivalnem položaju in mednarodni mobilnosti študentov v Sloveniji je potekala v akademskem letu 2006/2007 pod naslovom »Evroštudent SI 2007«. Vanjo je bilo vključenih 6280 študentov, kar je 6,5% slovenske študentske populacije, k sodelovanju so bili povabljeni po metodi stratificiranega slučajnega vzorčenja, vprašalnik so izpolnjevali preko svetovnega spleta. Študentje, ki so **v tej raziskavi ocenjevali** svoja **študijska in delovna bremena** kot slaba ali nesprejemljiva, so bili povprečno tedensko obremenjeni 58 ur. V populaciji študentov, ki so v tem času delali (predvidevamo, da kakršnakoli pridobitna zaposlitev), je znašal njihov delež 26%. Največ (51%) je bilo takšnih, ki se jim je zdela obremenitev še sprejemljiva, na teden pa sta jim študij in delo skupaj vzela 53 ur. Zelo zadovoljnih je bilo s svojo obremenitvijo zgolj 23% študentov, ki so študiju in delu namenili 41 ur tedensko. Zakrbljujoče je, da so bili študenti prenovljenih bolonjskih programov v spodnjih dveh kategorijah zelo blizu študentom nasploh, v kategoriji (zelo) nezadovoljnih pa so jih z obremenitvijo močno prekašali (70 ur). Predhodnja raziskava Evroštudent 2005 je dala v tem pogledu zelo podobne rezultate, le da, zanimivo, pri skupno neko-

Tabela 1:   *Primerjava podatkov o treh izvedbah predmeta pri treh pretežno sočasnih (oktober – december 2007) izvedbah predmeta »Multimediji« na treh šolah, v višješolskem strokovnem programu »Multimeidji«; nosilec in izvajalec je avtor pričujočega prispevka.*

Šola/institucija	IAM	Academia	IZ HERA
Št. študentov v skupini	65 študentov	50 študentov	15 študentov
Način študija	Redni	izredni	izredni
Oblika izvedbe srečanj, in online	samostojna izvedba predavanj s strani nosilca, tudi spremljanje online (pomoč mentorjev/asistentov le pri kasnejših obiskih podjetij)	delna pomoč/soizvedba predavanj treh mentorjev/asistentov (okoli polovica vseh srečanj v živo, tudi obiski podjetij, vendar nič pomoči online)	samostojna izvedba predavanj s strani nosilca, tudi spremljanje online, tudi obiski podjetij
Obseg izvedbe	10 tednov po 3 ure, (16 ur ogledov podjetij z mentorji/asistenti ni vštetih, saj so časovno zamaknjeni); podaljšane pedag. ure (60 min.)	6 tednov po (povprečno) 5 ur (všteto 16 ur ogledov podjetij z mentorji/asistenti)	8 tednov po (povprečno) 4 ure (všteto 16 ur ogledov podjetij z nosilcem)
Izmerjena obremenitev (anonimne ankete)[1]	8 ur / teden. = **80 ur**	16 ur / teden = **96 ur**	10 ur / teden = **80 ur**
Preračun UŠD/KT[2]	> pri cca 5 KT je to **16 ur na kredit**	> pri cca 5 KT je to **19 ur na kredit**	> pri cca 5 KT je to **16 ur na kredit**

[1] Spletne intranetne ankete so poleg 24 ocenjevalnih vprašanj glede izvedbe predmeta (petstopenjska lestvica) vsebovale tudi 13 vprašanj s samoocenjevalno trostopenjsko lestvico glede učnih učinkov in upešnosti uporabljenih metod. Ocena skupnih ur dela študenta je bila podana številčno na podlagi vprašanja »Koliko ur ste povprečno tedensko namenili za študij predmeta (vsota ur vseh vaših aktivnosti pri predmetu – predavanja, vaje, naloge, študij gradiv in drugih virov, priprava na izpit...)?«, ozadje tega pomembnega vprašanja je bilo obrazloženo v živo in znova pisno online, tik pred odprtjem spletne ankete. Pri tolmačenju rezultatov v nadaljevanju pričujočega prispevka so bili upoštevani tudi odzivi na odprto vprašanje oziroma iztočnico: »Drugi komentarji in pripombe (želje, pohvale, kritike povezane s predmetom ali učiteljem; konkretni predlogi izboljšav)«. Spletna anketa pri mariborski izvedbi predmeta (»Academia«) ni presegla splošno reprezentativne polovične udeležbe, zato smo rezultate kombinirali s (prav tako anonimno) anketo na papirnih obrazcih, ter s kvalitativnimi metodami.

[2] Predmet se po letošnji Bolonjski prenovi (ki je prinesla tudi pomembne vsebinske premike v smislu zmanjšanja obsega in prestrukturiranja snovi) vrednoti s 5KT. Pred prenovo je bilo zanj opredeljenih 48 ur predavanj in 24 ur seminarskih vaj. Predvsem seminarske aktivnosti so bile kombinirane s spletnim delom izvedbe predmeta (glej spodaj).

liko višjih vrednostih študijskih in delovnih obremenitev. (Evroštudent 2007)

3   Primerjava treh kombiniranih izvedb predmeta »Multimediji« po plati obremenitve študentov, in priporočila

Za preverbo zgornjih izhodišč in ilustracijo na primeru dobre prakse, ter nenazadnje v interesu izpeljav konkretnih izobraževalnih priporočil nam bodo služile tri neposredno primerljive kombinirane izvedbe predmeta »Multimediji« istoimenskega višješolskega strokovno-izobraževalnega programa – gre za njegov osrednji uvodni predmet. Vse tri primerjane izvedbe so bile vodene s strani nosilca predmeta (avtorja pričujočega prispevka) in so povsem primerljive po samem konceptu izvedbe, uporabljena so bila identična gradiva in učne metode, tudi ankete ob zaključku predmeta so bile enake. Deloma razlikovali pa so se parametri, ki jih samostojno določajo šole glede na izvedbo. Poleg lokacije izvedbe in nekoliko različnih značilnosti vstopne populacije (npr. med Ljubljano in Mariborom, čeprav so primerjani vzorci spričo treh različnih populacij na dveh zgostitvenih območjih bržkone nacionalno reprezentativni) so to bili predvsem: velikost skupine, sestava učiteljskega tima in njihove kompetence, terminska in organizacijska izvedba – kakor razvidno iz preglednice 1.

Glede na ugotovitev o višjih obremenjenostih študentov v t. i. »Bolonjskih« študijskih programih pri raziskavi »Evroštudent« je za primer programa »Multimediji« pomembno tudi, da se prav letos na nacionalni ravni pričenja izvedba programa v »**Bolonjsko prenovljeni**« in korenito posodobljeni obliki (le-ta vsebuje tudi preimenovanje študijskega programa v »Medijska produkcija«).

Z ozirom na zgoraj omenjeno merjenje zadovoljstva v povezavi z delovno oziroma študijsko obremenitvjo »Evroštudent« je najprej potrebno poudariti, da je na IAM predmet potekal v okviru **rednega** (pretežno dopoldanskega) študija, kjer študentje izven študija delajo praviloma redkeje oziroma manj od njihovih kolegov **v izrednem načinu izvedbe**; po drugi strani pa sta vzporedno z izvedbo predmeta »Multimediji« na IAM tekla še en študijsko predvidoma zahtevnejši (tuji jezik), in en udeležbeno manj zahtevni predmet programa (praktično izbraževanje). Na drugih dveh institucijah (Academia in IZ HERA) je tudi kvalitativno merjenje obremenjenosti (intervjuji, odprto anketno vprašanje) potrdilo večjo skupno obremenjenost študenta v primerjavi z redno izvedbo na IAM, saj so udeleženci predmeta (ki je potekal popoldan) dopoldan povečini delali v okviru bolj ali manj rednih zaposlitev – kar pomeni, da moramo k izmerjeni tedenski obrementvi prišteti tudi med 20 in 40 delovnih ur tedensko, in **na študenta torej gledati celostno, z vidika celodnevne delovne obremenitve**. Pri tem ni

nepomembno, da so številni študentje dragocene predmetno-področne izkušnje in primere (popoldan) črpali prav iz svojih (dopoldanskih) delovnih okolij. A nenazadnje tudi to dejstvo glede na raziskavo »Evroštudent« zniža možnost oziroma verjetnost študentovega »zadovoljstva« s skupnimi obremenitvami. Razmerje med izrednim in rednim načinom študija v tem pogledu vendarle nekoliko uravnoveša tudi dejstvo, da v slednjih dveh primerih istočasno ni potekala izvedba nobenega nadaljnjega predmeta programa. In vendar – *kako v študentovemu »počutju« oziroma študijskemu »zadovoljstvu« nenaklonjenih razmerah stimulirati visok nivo učne motivacije, in s tem zmanjšati občuteno obremenitev?*

Večina t. i. »seminarskih« aktivnosti (kolegialne in mentorirane diskusije izdelkov ter procesov njihovega nastajaja, študije primerov, predstavitve predobdelanih materialov, odgovori na vprašanja ipd.) so pri vseh treh različnih izvedbah predmeta »Multimediji« potekali online, v obliki (intranetno povsem odprtih) forumov, dodatno podprtih s sistemom avtomatiziranega pošiljanja kratkih in e-poštnih sporočil (asinhrono). Spletno učno okolje Moodle (moodle.org) je kot osrednja komunikacijska platforma služilo za izvedbo po kombiniranem načinu (redna izmenjava samostojnega in online študija ter živih prezenčnih srečanj), gradivo in študentski izdelki so bili v celoti posredovani v digitalnih formatih.

Takšna izrecna »primerljivost« tudi občutno zmanjša predvsem obremenitev nosilca predmeta oziroma učitelja pri načrtovanju in vzpostavti izvedbe predmeta. Še posebej v (tukaj obravnavanem) primeru, ko se učitelj znajde v sočasni trojni izvedbi predmeta s skupno 130 udeleženci, ob minimalni (oziroma vsaj nepredpisani) mentorski ali asistentski podpori, kot jo žal narekuje naraščajoča neoliberalna naravnanost izvajanja pedagoških procesov, je **opora v tehnologiji lahko ključnega pomena za zagotavljanje kakovostne učne (in poučevalne) izkušnje**.

3.1. Dejavniki zmanjšanja občutene obremenitve in povečanja učne motivacije ter učinka

Z vidika kombinirane izvedbe predmeta (srečanja v živo in online delo v spletnem učnem okolju Moodle) lahko sklepamo na kar nekaj dejavnikov, ki so ključno prispevali k dejstvu, da se je kljub primerjalno – z izvedbami predmetov na podobni ravni, in tudi na precej višjih, zahtevnejših ravneh študija[3] – visoki urni (kvantitativno merjeni) obremenitvi študentov njihovo (kvalitativno in kvantitativno merjeno) zadovoljstvo z izvedbo predmeta ter predvsem z lastnim učnim in osebnostnim napredkom izkazalo za precej visoko, kar so potrjevale tako ankete kot tudi osebni pogovori s študenti. Pri višjih študijskih obremenitvah vsebinsko in nivojsko zahtevnejših izvedb smo sicer pogosto priča nezadovoljstvu študentov zaradi

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[3] Že površen prelet širšega izbora spletno dostopnih statistik in (praviloma manj zanesljivih, ker samoevalvacijskih in promocijsko naravnanih) poročil pokaže, da najuspešnejše univerze na svetu redko dosegajo razmerja višja od 20 UŠD/KT. V Sloveniji doslej izmerjena povprečja pri univerzitetnih študijskih programih padajo tudi pod 10 UŠD/KT, le izjemoma pa zrasejo nad 15 UŠD/KT.

preobremenitev, še posebej če ni poskrbljeno za ustrezno **pozitivno motivacijo in razbremenitvene, sprostitvene aktivnosti**. *Kako smo se tega izziva lotili v obravnavanih izvedbah?*

K manjšemu občutku obremenjenosti naj bi po nekaterih raziskavah (Kember 2004) prispevala prerazporeditev aktivnosti preverjanja znanja na celoten potek izvedbe predmeta, s tem naj bi bilo razbremenjeno zaključno preverjanje znanja v smislu odvračanja od t. i. »kampanjskega« študijskega načina, pozitiven pa je lahko tudi učinek sprotne povratne informacije o (delnih) študijskih dosežkih. Po vsakem srečanju v živo (enkrat do dvakrat na teden) so študentje predmeta »Multimediji« tako online (torej s samostojno aktivnostjo na podlagi prezenčno-kontaktno predelane snovi in e-gradiv) reševali **domače naloge.** Podane so bile v obliki odprtih (deloma esejsko zastavljenih) vprašanj, ki so predstavljala dodaten izziv glede na prezenčne učne aktivnosti in tam (*ex cathedra*) obdelana vprašanja. Ker so študentje odgovore objavljali na (intranetnem) spletnem forumu, se je tam pogosto nadaljevala **diskusija iz prezenčnega razrednega srečanja** na določene (kot take izpostavljene in deloma tudi od učitelja online stimulirane, torej mentorsko moderirane) teme. Študentje so preko spleta lahko iskali in obdelovali **nadaljnje študijske vire**, povečini so jih našli samostojno, ovrednotila pa jih je sama spletna skupnost študijskih kolegov – seveda pod nadzorom učitelja. Odgovori na naloge so bili tudi ustrezno (skupnostno) ocenjeni, tako s strani študijskih kolegov kot s strani učitelja (glej spodaj). Sicer pregovorno osovražena dejavnost domačih nalog je v našem primeru požela tudi veliko odobravanje v anonimnih anketah.

Razvoj seminarskih nalog (vsak študent je s pomočjo spletne tehnologije wiki izbral svojo temo z uvodno ponujenega seznama) je potekal prav tako v duhu **kolegialnega sodelovanja** in (predvsem online) diskusije. Seminarske naloge so študentje razvijali v dveh večjih komunikacijskih in refleksivnih korakih: prva verzija naloge je bila (po forumski objavi) podvržena komentarjem kolegov – kar je nekoliko razbremenilo in razpršilo učiteljevo, praviloma precej obremenjujočo mentorsko vlogo pri razvoju seminarske naloge, pripomoglo pa tudi k **živahnejši socialni dinamiki v skupini** (študentov prvega letnika študija). Tako so seminarske naloge še pred drugo, končno verzijo bile podvržene (s strani učitelja sicer online moderirani) **konstruktivni kolegialni kritiki**, ki naj bi veljala za eno izmed najkakovostnejših in motivacijsko najmočnejših metod kolektivnega učenja. Končno verzijo naloge so študentje poleg oddaje v »e-nabiralnik« lahko znova objavili na forumu predmeta, v nadaljno presojo kolegom in kot skupnostni izkaz dejanske »izboljšave«.

Poleg obvezne **osebne predstavitve na ravni osebnega profila** znotraj spletnega učnega okolja (z osebno sliko in krajšim osebnim opisom ter s spletnimi povezavami v kontekstu **socialnega spleta oziroma spletnega mreženja**) so posamezni študentje glede na izbrano temo seminarske naloge imeli možnost njene **predstavitve v živo**. V manjši skupini (IZ HERA) so te predstavitve izvedli vsi udeleženci, v drugih dveh (bolj številnih) izvedbah pa so izbrane teme predstavljali le tisti, ki so bodisi dobro obvladali tematiko (npr. zaradi obstoječih izkušenj in znanj), bodisi bili dovolj izkušeni govorci. In vendar se je v obeh pogledih našla kakšna posebej svetla izjema – predstavitev avtorju dotlej neznane teme kolegom se je lahko izkazala za precejšenj (motivacijsko pozitiven) izziv, in pot do uveljavitve v skupnosti (»brucev«). Te kratke in jedrnate (3-5 minutne) predstavitve je učitelj – vsled pregovorne suhoparnosti temeljnih delov študijske snovi – smiselno umestil v tematski potek predmeta in izkoristil kot iztočnice tako **za priložnostne diskusije kot za organizirano delo v skupinah**. Ankete so pokazale pozitiven vpliv na razgibanost prezenčnega dela izvedbe predmeta v smislu (sicer pretežno frontalno opredeljenih) »predavanj«. Predstavitvene datoteke (v formatih PPT, PDF, HTML) objavljene online pa so tudi tistim, ki so od prezenčnega srečanja fizično izostali, nudile **možnost vsaj delne nadoknaditve** učne (in skozi online diskusijo tudi skupnostne) izkušnje.

Končno je tako online kot prezenčni del izvedbe dodatno razgibal še koncept **ogleda treh glasbenih videospotov** ob vsakem srečanju (na začetku, po premoru in na koncu). Kljub dejstvu, da ni šlo za izrecno ali neposredno navezavo tematike spotov na učno snov, je bila tako v predmet vnešena še dodatna dinamizacijo prezenčnega dela izvedbe, s tem pa tudi dodatne posredne stimulacije tematskih diskusij, ki so se nadaljevale online po srečanju v živo. Učiteljeva obremenitev je v tem primeru obsegala zgolj (skrben, tematski) izbor videospotov, njihovo predvajanje in proženje diskusije tako v živo kot (asinhrono) online. Sodeč po anketnih odzivih so tematsko izbrani videospoti kakovostnih, tako aktualnih kot zgodovinsko oziroma družbeno pomembnih in priznanih izvajalcev, pri študentih (resda »medijskega« študijskega področja) naleteli na precejšnje odobravanje. Nenazadnje so študentom redno predvajani videospoti nudili tudi kratkomalo – **sprostitev ob glasbi**.

Uspešnost študentov oziroma prepustnost predmeta na prvem roku je bila primerljiva pri vseh treh izvedbah. Udeležba na prvem roku je bila odstotno najvišja na IZ HERA, najnižja na IAM – kar lahko pripišemo manjši (in bolj dinamični ter notranje povezani) skupini ter sočasni osredotočenosti na en sam predmet v primeru izredne izvedbe na IZ HERA – medtem ko si redni študentje študijske obremenitve praviloma (lahko) razporedijo enakomerneje čez vse leto. Uspešnost opravljanja (večdelnega, prav tako kombiniranega) izpita pa je bila, predvidoma prav zaradi tukaj navadenih razlogov, izredno visoka. Pri vseh treh izvedbah je zato potrebno posebej izpostaviti tudi **transfer obremenitve ocenjevanja s predavatelja na kolegialno ocenjevanje** (študentje so komentirali in ocenjevali redne krajše tedenske pisne izdelke kolegov, in tako prispevali oziroma ključno vplivali na 30% končne ocene, dejanski vpliv kolegialne ocene je bil potrjen konsenzualno, demokratično). To je posebej zanimivo z vidika obremenjenosti učitelja oziroma nosilca, ki v danem primeru podeli »le še« skupno 14 delnih ocen (od 1 do 5%) na posameznega študenta (transparentna sestava ocene: 30% seminarska, 20% zagovor, 20% ustno; ločeni

kriteriji po 5%). Ta podatek pridobi še dodaten pomen, če upoštevamo, da si poudarjeno »diskusijsko«, torej interaktivno zastavljena izvedba predmeta lahko obeta kar največ tudi od ustnega preverjanja znanja – ki na ta način izzveni prej kot voden skupinski pogovor na (četudi temeljne, in nenazadnje ocenjevane) študijske teme.

Tako lahko predpostavimo, da bi si naj v **idealnem pedagoškem obremenitvenem** modelu *učenec in učitelj izmenjevala faze večjih in manjših, pozitivnih (»motivacijskih«) in negativnih (»stresnih«) obremenitev, dinamiko pa prilagajala po eni strani konceptu izvedbe predmeta, po drugi pa trenutni »razredni klimi«.* In še posebej ob ustrezni uporabi e-izobraževalnih oblik je to vsekakor mogoče, morda tudi neizbežno.

3.2. Interaktivni model kombiniranega izobraževanja za zmanjšanje občutene obremenitve

Pričujoča primerjava treh izvedb kaže na precej uspešen, (ker) poudarjeno **interaktivni model izvedbe predmeta**, ki lahko – še posebej v kombiniranih izobraževalnih oblikah – **zagotavlja zmanjšanje občutene obremenitve** pri študentih, nenazadnje pa tudi pri učiteljih. Ta ima še več prednosti, če upoštevamo tudi rabo spletnega portala, oziroma spleta nasploh, kot interaktivnega (super)medija sodobne družbe, in nenazadnje aktualne pedagogike. Kombinacija vrednotenja kvantitativnih in kvalitativnih rezultatov anket (odprta vprašanja o zadovoljstvu) pokaže, da so študentje poleg **organizacijske razbremenjenosti** (dober pregled nad potekom predmeta in orientacija v študijski snovi oziroma gradivih) z uporabo sistema za upravljanje izobraževalnega procesa (Moodle) pridobili predvsem **zanesljivo** (stalna dostopnost, arhiviranje), **varno** (zaprt šolski intranet) in **zmogljivo** (vsestranska kompatibilnost) **komunikacijsko in socialno platformo** (raba forumov, asinhronega medosebnega sporočanja, soustvarjalnih tehnologij kot npr. wiki, datotečnih prenosov ipd.).

Pri vsem zgoraj navedenem seveda ne moremo mimo dejstva, da so študenti višješolskega programa »Multimediji« povečini tudi močneje **zainteresirani in dojemljivi za medijsko tematiko**, torej samo tehnologijo in obliko oziroma format podajanja snovi ter učni aktivnosti. To nedvomno znatno pripomore k samoiniciativnosti študentov v online diskusijah, njihovi višji motiviranosti za nadaljnje individualno raziskovanje dodatnih spletnih virov, poglabljanje v snov, nenazadnje tudi problematiziranje samih medijskih oziroma tehnoloških razsežnosti tovrstnega načina izvedbe ipd. In vendar se – tudi v luči vsesplošne

promocije rabe IKT tako v zasebnih kot v poslovnih okoljih, ter vse bolj zevajočega generacijskega digitalnega prepada – sodobno izobraževanje ne bi smelo (več) izogibati *uporabi (venomer) novih informacijsko-komunikacijskih tehnologij v prid zvišani motivaciji, boljšemu učnemu učinku,* in s tem nenazadnje **tehno-optimističnemu zasuku vse težavnejšega razmerja človek-stroj**. Pri tem pa seveda nikakor ne gre pozabiti na »dobre stare« pedagoške prijeme – predvsem na **pogovor, dialog,** in četudi se del le-tega odvije online, oziroma intermedijsko (Giesecke 2002). Odkrita tematizacija, refleksija in nenazadnje tudi problematizacija vedno bolj in kompleksneje tehniziranih izobraževalnih metod so lahko prav iz zgoraj navedenih razlogov posebej priporočljivi pristopi k osveževanju ali prenovi marsikaterega predmeta oziroma programa.

4   Viri

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Učenje na daljavo v procesu izobraževanja s področja zoperstavljanja terorizmu

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Nove asimetrične grožnje vplivajo tudi na razvijanja novih pristopov izobraževanja v okviru procesa zoperstavljanja terorizmu. S spoznanjem, da je človek in njegova sposobnost načrtovanja in prilagajanja spremembam v okolju ključni dejavnik uspeha organizacije, postaja ustrezno izobražen in usposobljen človek najpomembnejši vir učinkovitega procesa zoperstavljanja terorizmu. Korenite spremembe v svetovnem varnostnem okolju in napredek v razvoju informacijske tehnologije in komunikacij s povečanjem znanja, je skupaj z uveljavljanjem kriterijev globalnega trga eden izmed najpomembnejših dejavnikov, ki oblikujejo sodobno družbo, družbo znanja in novih sodobnih tehnologij. Nacionalnovarnostni subjekti se morajo zavedati, da izobrazba njihovih pripadnikov ena izmed pomembnejših dejavnikov za uspeh organizacije. Vsekakor je jasno, da ni enotnega konsenza kako izobraževati bodoče strokovnjake na področju zoperstavljanja terorizmu, obstaja kar nekaj alternativnih idej in poti. Možnost izražanja kritičnega mišljenja na področju proučevanja terorizma predstavlja prvi nujni predpogoj za uspešnost razvoja tega raziskovalnega področja. Znanje in sposobnosti pripadnikov takih organizacij, so postale eden od poglavitnih dejavnikov za njeno učinkovitost v procesu zoperstavljanja terorizmu. Zato je bistveno, da se te organizacije zavedajo dejstva, da je potrebno zagotavljati nenehno vlaganje v izboljšanje znanja in sposobnosti njenih pripadnikov. Aplikacije novih modelov izobraževanja med katere sodi tudi izobraževanje na daljavo, je lahko učinkovita pot za doseganje želenih ciljev.

Ključne besede: zoperstavljanje terorizmu, izobraževanje na daljavo, informacijsko komunikacijska tehnologija.

1 Uvodna razmišljanja

Mednarodni terorizem v vseh svojih pojavnih oblikah je v zadnjem obdobju postal pomemben dejavnik, ki močno vpliva na dinamiko v mednarodnih odnosih. Zavedanje o pomembnosti teroristične grožnje se sicer spreminja in v določenih časovnih obdobjih celo upada, vendar ga vedno nova teroristična dejanja stalno postavljajo na zelo visok nivo. Uničujoči napadi različnih terorističnih skupin, varnostno okolje, v katerem živimo, postavljajo kot okvir, kjer so teroristične grožnje stalno prisotne in so rezultat nestabilnosti, političnega nasilja ter predstavljajo transformacijo načina bojevanja v oblike na katere subjekti na nacionalni in mednarodni ravni niso bili v celoti pripravljeni (Crenshaw, 2001:36). Omenjene grožnje vplivajo tudi na razvijanja novih pristopov izobraževanja v okviru procesa zoperstavljanja terorizmu.

S spoznanjem, da je človek in njegova sposobnost načrtovanja in prilagajanja spremembam v okolju ključni dejavnik uspeha organizacije, postaja ustrezno izobražen in usposobljen človek najpomembnejši vir učinkovitega procesa zoperstavljanja terorizmu (Combs, 2003:57). V današnjem času strokovnih sprememb in prehoda v družbo znanja, tehnološkega napredka, razmaha informacijske tehnologije ter kopičenja informacij z vseh področij življenja, je postalo znanje ena najpomembnejših konkurenč-

nih prednosti posameznika, organizacij in celotne družbe. Spremenil se ni le način dela, temveč tudi način učenja, ki od posameznika in organizacije terja, da se prilagaja novim razmeram. Znanje in spretnosti, ki jih posameznik pridobi skozi formalno izobraževanje, hitro zastarevajo, zato sta nenehno izobraževanje in usposabljanje trajna in nepretrgana procesa tako za posameznika kot tudi za organizacijo, kjer deluje tak posameznik.

Korenite spremembe v svetovnem varnostnem okolju in družbi nasploh, ki smo jim priča zadnja leta, je mogoče primerjati samo s spremembami v času industrijske revolucije. Razlika pa je v vzrokih in hitrosti sprememb. Napredek v razvoju informacijske tehnologije in komunikacij s povečanjem znanja, je skupaj z uveljavljanjem kriterijev globalnega trga eden izmed najpomembnejših dejavnikov, ki oblikujejo sodobno družbo, družbo znanja in novih sodobnih tehnologij. V tej družbi je posameznik fleksibilen, prilagodljiv, kreativen, inovativen, uporablja tehnologijo, pridobiva znanje, je pripravljen na uvajanje in upravljanje s stalnimi spremembami in na t.i. vseživljensko učenje (Stare, Bučar: 2005:35). Dandanes je potrebno biti pripravljen na novo dobo internetnega sveta, v katerem je lahko vsakdo povezan z vsakim ob vsakem času. V tej dobi postaja posameznik svetovno konkurenčen s svojim znanjem in ustrezno uporabo sodobnih tehnologij.

Na žalost se je potrebno zavedati, da tem procesom sledijo tudi teroristične organizacije, ki so ravno zaradi

fleksibilnosti svoje organizacijske strukture in načina delovanja, še bolj pripravljene uporabljati nove tehnološke pridobitve pri usposabljanju in rekrutiranju svojega kadra (Gatlung, 2002:158). Nacionalnovarnostni subjekti se morajo zavedati, da izobrazba njihovih pripadnikov sama po sebi ni več vrednota, namenjena izključno posamezniku, temveč postaja čedače bolj merilo razvoja in učinkovitosti delovanja njihove organizacije. Znanje in sposobnosti pripadnikov takih organizacij, so postale eden od poglavitnih dejavnikov za njeno učinkovitost v procesu zoperstavljanja terorizmu. Zato je bistveno, da se te organizacije zavedajo dejstva, da je potrebno zagotavljati nenehno vlaganje v izboljšanje znanja in sposobnosti njenih pripadnikov.

2   Informacijska tehnologija kot podpora procesom učenja na daljavo s področja zoperstavljanja terorizmu

V učinkovitem procesu izobraževanja na področju zoperstavljanja terorizmu je zelo pomembno njegovo sistematično proučevanje in uporaba novih tehnologij v izobraževalnem procesu. Pomembno je namreč zavedanje prepoznavanja grožnje, ki se zrcali v nasprotujoči dilemi o moči konvencionalne modrosti nad nekonvencionalno kreativnostjo (Sloan, 2007:12). Danes govorimo o družbi znanja, ki jo v Evropski uniji imenujemo »knowledge age«[1]. Družbo znanja opredeljuje vrsta medsebojno prepletenih dejavnikov. Ti dejavniki so predvsem izobraževanje in usposabljanje, raziskave in tehnološki razvoj in inoviranje, ter uporaba informacijsko-komunikacijske tehnologije v vse segmente družbe, vključno z nacionalnovarnostnim sistemom. V današnji družbi, družbi razmaha informacijske tehnologije in splošnega tehnološkeha napredka, je postalo znanje eno izmed ključnih posameznikovih predosti na področju svojega delovanja. Zaradi navedenega je zelo pomembno, da posameznik stalno nadgrajuje že pridobljena znanja. Pri tem pa se pojavlja več dilem, ki so predvsem usmerjene na dejstvo, da je tempo izvajanja vsakodnevnih delovnih procesov tako visok, da za procese nadaljnjega izobraževanja enostavno zmanjka časa. Ti razlogi sprožajo pomisleke in pripeljejo do spoznanja, da so klasične, tradicionalne oblike študija in učenja okorni in izredno neflesibilni. Te tradicionalne oblike izobraževanja ne morejo več učinkovito in pravočasno zagotoviti novega znanja ter nadomestiti in nadgraditi starega. V zadnjem desetletju je tehnološki napredek na področju informacijsko komunikacijske tehnologije odprl nove možnosti in dal izobraževanju nove razsežnosti. Klasičen način podajanja znanja preko izobraževalnih institucij in v prisotnosti učiteljev postopno zamenjuje nova oblika izobraževanja, ki postaja vse bolj aktualna tudi na področju nacionalne in mednarodne varnosti. V okviru izobraževanja na daljavo se v zadnjem času po zaslugi razvoja informacijsko komunikacijske tehnolo-

gije vedno bolj uveljavlja e-izobraževanje. To označuje izobraževanje, kjer informacijska tehnologija delno ali v celoti nastopa, kot posrednik med akterji izobraževanja. Značilnost takšnega izobraževanja je, da lahko posameznik preko različnih kanalov in medijev dostopa do učne snovi, ne da bi bili akterji časovno in geografsko povezani (Rumble, 1997: 145). Garrison in Anderson (2003:112) trdita, da bo e-izobraževanje neizogibno preoblikovalo vse oblike učenja in izobraževanja v enaindvajsetem stoletju, saj s svojo odprtostjo, dostopnostjo, razvitostjo tehnologije in cenovno učinkovitostjo ponuja ustrezno nadomestilo tradicionalnemu predavanju v razredu. Nekateri avtorji kot naprimer (Kokalj, 2003:215) celo menijo, da e-izobraževanje predstavlja strateško orodje za doseganje dolgoročnega uspeha organizacije ravno, zaradi dejstva, ker ponuja takojšnje rešitve za prilagajanje turbolentnim spremembam na trgu, pospešuje inovativnost ter kot najpomembnejše, zvišuje učinkovitost in produktivnost zaposlenih. E-izobraževanje kot alternativa klasičnemu izobraževanju lahko ponudi ustrezne rešitve na časovne, ekonomske in prostorkse izzive v poslovnem okolju. Zagotavlja torej številne možnosti hitrega dopolnjevanja vsebin izobraževanja in sočasno izvajanje za večje število uporabnikov. Uporaba multimedie v izobraževalnem procesu ponuja veliko možnosti za oblikovanje bogatih in pristnih učnih izkušenj, saj omogoča boljše tehnike poučevanja in aktivira udeležence k samostojnemu razmišljanju. Dobro oblikovani in učinkoviti multimedijski programi za izobraževanje lahko kakovostno dopolnijo in pospešijo razvoj miselnih spretnosti, tako da imajo udeleženci občutek, da nadzirajo svoje učenje in zaradi tega prevzemajo večjo odgovornost za svoje učenje, so uspešnejši in bolj učinkoviti (Kokalj, 2003:557).

Izkušnje v svetu in doma kažejo, da se e-izobraževanje v organizacije praviloma uvaja predvsem z namenom zniževanja stroškov izobraževanja ter zaradi časovne in krajevne flesibilnosti (Kokalj, 2003:220). Predvsem je uveljavljanje e-izobraževanja zaznati v poslovnem okolju, kjer je po mnenju IDC (International Data Corporation) v letu 2004 skoraj polovica usposabljanja in izobraževanja poslovnih veščin potekalo s pomočjo e-izobraževanja. Ameriška družba za usposabljanje in razvoj s svojimi podatki dokazuje, da je vsakem trenutku na svetovnem spletu na voljo več kot 650.000 tečajev. CISCO sistemi (proizvajalec mrežne opreme) pa je objavil podatek, da so z izobraževanjem 80% svojih zaposlenih prihranili 40-60% svojih izdatkov (Dunn, 2003:63).

Izobraževalni procesi na področju terorizma so se začeli dopolnjevati in dograjevati, kot odziv na določena teroristična dejanja večjih razsežnosti. Ob koncu prejšnjega stoletja je bilo vedno več aktivnosti usmerjeno na področje izobraževanja in usposabljanja organov, zadolženih za prvi odziv pri odpravljanju posledic terorističnih dejanj. Še vedno pa obstaja močna potreba razvoja učinkovitega izobraževanja na področju razumevanja, napovedovanja in proaktivnega delovanja proti terorizmu, ki ga bi bilo potrebno izvajati na akademskem, operativnem

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[1] Družba znanja.

in taktičnem nivoju. Raziskovanje mora biti usmerjeno v izdelovanje ekspertiz, ki ne bodo izvedene po načelu obstoječih miselnih vzorcev temveč bodo temeljile na novem znanju in svežih idejah akademskega okolja. Sedaj zares obstaja potreba, da izobraževalni sistem uspe izobraziti dovolj veliko število kadrovskega potenciala, ki bo sposoben izvajati učinkovite ukrepe na področju zoperstavljanja terorizmu. (Čaleta 2008:446)

Izobraževanje in usposabljanje s področja zoperstavljanja terorizmu poteka v okviru javno dostopnih oblik izobraževanja na posameznih javnih izobraževalnih ustanovah. Na drugi strani pa poteka izobraževanje v okviru izobraževalnih ustanov, ki so polzaprtega ali popolno zaprtega tipa. To pomeni, da je selekcija kandidatov že pred prihodom na izobraževanja zelo restriktivna in povezana z določenimi pogoji. Taki pogoji so zaposlenost v posameznih organizacijah nacionalnovarnostnih sistemov ali mednarodno varnostnih organizacij, ustrezna varnostno preverjanje, ustrezna predznanja ali izkušnje in pomembnost delovnega mesta. Na tem mestu se že sama po sebi ponuja dilema o uporabnosti študija na daljavo in v okviru tega e-izobraževanja na področju zoperstavljanja terorizmu. V analizi primernosti študija na daljavo na področju zoperstavljanja terorizmu lahko pridemo do različnih ocen dejavnikov, ki podpirajo ali nasprotujejo intenzivnejšemu uveljavljanju obravnavane oblike izobraževanja v izobraževalne procese v okviru nacionalnovarnostnega sistema. Predvsem uspešno izvajanje študija na daljavo zahteva od sodelujočih nove oblike pismenosti in nove sposobnosti učenja, hkrati pa jih tudi razvija. Načrtovanje študijskih aktivnosti, izbira ustreznih metod dela, komunikacija s mentorjem, svetovanje študetom, stalno spremljanje njihovega dela in napredovanja je ključnega pomena pri motiviranju študentov in doseganju ciljev programa. Problem se pojavlja pri neaktivnih študentih, ki niso vešči sprotnega opravljanja študijskih aktivnosti. Med potencialne prednosti obravnavanega načina izobraževanja vsekakor sodi dejstvo, da taka oblika študija omogoča večjo svobodo časa, kraja in tempa študija. Svoboda kraja se kaže v tem, da lahko slušatelj izvaja izobraževanje kjerkoli, ni nujno

potrebna fizična prisotnost na mestu, kjer se izvaja izobraževanje. Podobna prožnost se izkaže tudi pri izbiri časa študija. Druga pomembna prednost tovrstnega izobraževanja je, da omogoča večje možnosti za izobraževanje. V nekaterih primerih se bo tak študij lahko pokazal za učinkovitega saj bo povečal možnost dostopa večjemu številu kandidatov, tudi iz tistih držav, ki niso finančno zelo bogate in si ne morejo privoščiti visokih stroškov s potovanjem in nastanitvijo svojih pripadnikov. Na drugi strani pa zaradi fleksibilnosti izobraževanja pritegne v ciklus izobraževanja večje število ljudi, ki se na tradicionalen način ne bi mogli izobraževati. S študijem na daljavo se hitreje kot na kateri koli drugi način doseže večje število izobraženih v neki državi, saj je potrebno precej manj predavateljev kot pri klasičnem izobraževanju, niso potrebna vlaganja v nove predavalnice in zmogljivosti za nastanitev študentov (Zagmajster: 1995:115). Naslednja pomembna prednos je vsekakor izboljšanje kvalitete na tradicionalnih visokošolskih institucijah. Posledično je vpliv študija na daljavo na tradicionalne oblike izobraževanja večplasten in se odraža v izboljšanju kvalitete strokovne literature, spodbujanje kritične misli pri študentih, izboljšanje pedagoškega procesa tako v fazi priprave kakor tudi v fazi izvedbeter študij na daljavo kot po moji oceni najpomembnejše, vpliva na pospeševanju medeuniverzitetnega sodelovanja. Seveda pa lahko v analizi primernosti študija na daljavo v procesu izobraževanja protiterorističnih strokovnjakov opredelimo tudi potencialne pomanjkljivosti študija. Izobražujoči so pri študiju na daljavo socialno izolirani, saj so le anonimni posamezniki v množici, ki od izobraževalne institucije dobiva na dom gradiva za študij. Temu procesu socializacije in spoznavanja strokovnjakov iz različnih okolj se v trenutnih procesih izobraževanja namenja izredno velik poudarek. Osebna poznanstva, ki jih pridobijo slušatelji v času skupnega izobraževanja na določeni instituciji so lahko v kasnejših procesih zoperstavljanja terorizmu izredno velikega pomena. V tej obravnavani obliki izobraževanja lahko to ocenimo, kot resen negativni dejavnik, ki ga je zaradi oblike izobraževanja zelo težko premostiti. Druga pomembna okoliščina, ki negativ-
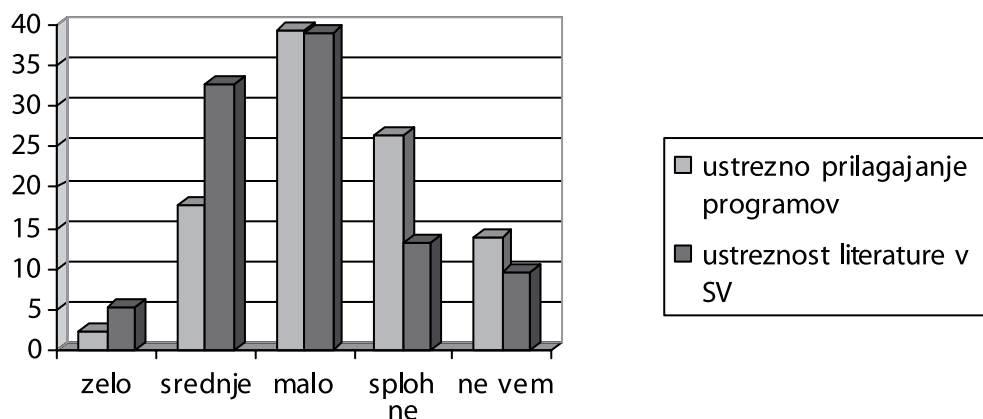
Slika 1: Pregled primerjave rezultatov v razmerju med ustreznostjo programov in literature; na navpični osi so odstotki.

no vpliva na sam proces izobraževanja je, da je študent v vlogi pasivnega sprejemnika informacij, s tem pa obstaja nevarnost enosmerne komunikacije. Nevarnost enosmerne komunikacije se kaže tudi v dejstvu, da se poskušajo študentje čim bolj izogniti tistim delom študijskih gradiv, ki spodbujajo h globjemu in bolj kritičnemu pristopu k študiju. Pri problemu z dostopnostjo medijev se nakazujeta dva problema. Prvi je problem fizičnega dostopa do medijev, drugi pa predstavlja pomanjkanje izkušenj pri uporabljanju informacijsko komunikacijskih tehnologij v izobraževalne namene. Kot zadnje bi veljalo opozoriti na nevarnost velikega osipa. Obravnavani študij namreč zahteva od slušatelja dobro organiziranje časa med različne obveznosti in veliko mero samodiscipline.

Mentor ima pri izobraževanju na daljavo in izobraževanju preko interneta ključno vlogo. Še posebej to velja za tako specifične in kompleksne vsebine, katere se pojavljajo na področju zoperstavljanju terorizmu. Udeležence posameznih izobraževalnih oblik spremlja, organizira njihovo delo in jih spodbuja med samim procesom izobraževanja.Od mentorja se pričakuje, da bo imel dovolj tehničnega znanja, strokovne usposobljenosti in spretnosti za upravljanje z okoljem, da bo znal pravilno pomagati udeležencem pri nastalih težavah ter presoditi, kdaj se aktivno vključiti v delo udeležencev (Geder, 2003:558).

V Slovenski vojski je bila izvedena raziskava[2], ki je med drugim vključevala tudi možnost ocenjevanja ustreznosti izobraževalnih procesov na področju zoperstavljanja terorizma v sami Slovenski vojski. Na konkretno vprašanje ali se izobraževalni programi v Slovenski vojski ustrezno prilagajajo pojavom asimetričnih groženj med katerimi prednjači terorizem, so bili pridobljeni naslednji odgovori, ki kažejo v smeri prepočasnega prilagajanja programov izobraževanja v Slovenski vojski. Pripadniki so namreč v razmerju odgovorov od 1-4 ocenili navedena dejstva s srednjo oceno 1,9. Nizka srednja ocena vsekakor kaže na potrebo po hitrejšemu spreminjanju programov in uvajanju ustreznih novih vsebin, ki se dotikako novoporajajočih asimetričnih groženj. Procesi učenja na daljavo lahko nudijo določeno pomoč načrtovalcem izobraževanj, da omenjeno izobraževanje približajo večjemu krogu zainteresiranih pripadnikov oboroženih sil.

Iz navedene analize, katera je razvidna na sliki št. 1 in primerjave podatkov o ustreznosti prilagajanja programov v Slovenski vojski na pojave novih asimetričnih groženj in vprašanjem ali strokovna literatura v SV v zadostni meri obravnava teme povezane s terorizmom lahko ocenimi, da se literatura hitreje prilagaja novim zahtevam varnostnega okolja, kakor samo programi izobarževanja. Druga razlaga bi lahko šla v smeri, da je dostop do tiska-

nih medijev in literature, ki jo izdaja Slovenska vojska lažji in zato bolj množičen, kakor možnost za posameznika pripadnika, da izvede kakršnokoli obliko izobraževanja v izobraževalnem procesu Slovenske vojske. Za izboljšanje dostopnosti sistema izobraževanja v Slovenski vojski je oblika izobraževanja na daljavo z uporabo novih informacijsko komunikacijskih tehnologij vsekakor zelo dobra rešitev, ki jo bo potrebno bolj intenzivno vključevati v vse oblike izobraževanja, tudi tiste, ki so ciljno usmerjene na področje zoperstavljanja terorizma.

3   Zaključek

Vsekakor je jasno, da ni enotnega konsenza kako izobraževati bodoče strokovnjake na področju zoperstavljanja terorizmu, obstaja kar nekaj alternativnih idej in poti. Možnost izražanja kritičnega mišljenja na področju proučevanja terorizma predstavlja prvi nujni predpogoj za uspešnost razvoja tega raziskovalnega področja. Seveda se pri uveljavljanju kritične misli vsekakor poraja potreba po zmožnosti prepoznavanja in ločevanja pomembnih informacij na področju proučevanja terorizma, ki je v zadnjem obdobju preplavljen z množico nepomembnih oziroma netočnih podatkov. Vsekakor je kvaliteta kritičnega mišljenja in raziskovanja odvisna tudi od zmožnosti preseganja okvirov trenutnih ocen ogroženosti in zmožnost pogleda v prihodnost.

Lahko se strinjamo, da terorizem ni svojstven samo eni raziskovalni disciplini. Vsekakor bo zaradi svojih pojavnih oblik imel vpliv na različna področja raziskovanja od političnih ved, psihologije, mirovnih študij, kriznega upravljanja, zgodovine, verskih in drugih študij. Vsekakor je potrebno težiti k vzpostavljanju ustrezne komunikacije med vsemi zainteresiranimi strukturami, ki bodo s svojim znanjem, izkušnjami in močjo vplivanja na dejansko politiko izvajanja vplivali na vzpostavitev ustreznih procesov izobraževanja nove generacije strokovnjakov na področju zoperstavljanja terorizmu. Vsekakor mora sistem izobraževanja preprečevati ali vsaj omejevati usmerjenost v ozko zastavljene problemske sklope in trenutne vire ogrožanja. Izobraževalni programi morajo temeljiti na interdisciplinarnem pristopu in tako omogočati koordinacijo in komunikacijo med različnimi znanstvenimi vedami pri preučevanju pojavov terorizma. (Čaleta, 2008:459) Vsekakor bo potrebno zagotoviti, da bo odzivnost na spremembe v programih in procesih izobraževanja ustrezno učinkovita ter se bo prilagajala vsem spremembam v družbenem okolju. Za dosego tega cilja bo potrebno izvesti določene korake, ki bodo pomenili

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[2] V Slovenski vojski je bila izvedena posebna raziskava, ki je na vzorcu 369 pripadnikov in pripadnic omogočila vpogled njihovih stališč do določenih obravnavanih problemov zoperstavljanja terorizmu. Omenjen vzorec predstavlja 5,27 % vseh zaposlenih pripadnikov Slovenske vojske. Anketiranje je bilo izvedeno zelo sistematično tako, da so bili anketirani vprašalniki proporcionalno izpolnjeni v vseh poveljstvih in enotah Slovenske vojske, kar nam je zagotovilo ustreznost pridobljenih podatkov in sorazmernost med organizacijskimi strukturami, ki se srečujejo z različnimi oblikami in okolji dela ter tako posledično tudi z različnimi oblikami ogrožanja pri svojem delu. Med anketiranimi je bilo tudi 65 pripadnic, kar predstavlja 17,6% vseh anketiranih in odraža tudi odstotek pripadnic v celotni strukturi Slovenske vojske. Pri demografskih podatkih anketiranih velja še posebej izpostaviti, da jih je 144 med njimi že bilo na določeni operaciji kriznega odzivanja, kar predstavlja 39,01% vseh anketiranih..

odmik od tradicionalno birokratskega pristopa urejanja razmerij znotraj akademsko-raziskovalnega okolja in ravno tako pri urejanju razmerij z drugimi družbenimi podsistemi oz. referenčnimi skupinami. Prišel je čas, ko si na področju izobraževanja protiterorističnih strokovnjakov nikakor več ne moremo privoščiti dolgotrajnega birokratsko naravnanega iskanja ustreznih programov in nezdravega tekmovanja med različnimi izobraževalno-raziskovalnimi osnovami.

Brez ustrezne sistemske vzpostavitve modela usposabljanja in izobraževanja na področju zoperstavljanja terorizmu v Slovenski vojski, ne bo mogoče zagotoviti ustreznega delovanja ter vzpostavitve predvidenih zmogljivosti. Vojaško izobraževanje in usposabljanje sta procesa pridobivanja in razvijanja posebnih in funkcionalnih vojaških znanj, sposobnosti, veščin in navad za izvajanje nalog, za potrebe vojaške obrambe in drugih nalog Slovenske vojske, med katere spada tudi zoperstavljanje terorizmu. Sistem vojaškega izobraževanja in usposabljanja na področju zoperstavljanja terorizmu ni avtonomen in je nujno povezan z zmogljivostmi ostalih subjektov nacionalnovarnostnega sistema Slovenije. Slovenija in njene oborožene sile so zaradi svoje majhnosti in omejenosti resursov na tem področju, primorane svoje kadre pošiljati na izobraževanje in usposabljanje v tujino. Rešitve, ki jih ponuja oblika izobraževanja študija na daljavo lahko bistveno racionalizira stroške in dvigne kvaliteto usposobljenosti širšega kroga strokovnjakov, ki se posredno ali neposredno ukvarjajo s področjem zoperstavljanja terorizmu.

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Model samovrednotenja učiteljev

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Članek zajema opis izdelanega modela za samovrednotenje učiteljev, ki bo pripomogel k kvalitetnejši izvedbi izobraževalnega procesa, saj se bodo učitelji na osnovi modela lahko samovrednotili in izboljšali kritične točke svojega poučevanja. Izdelana sta dva modela, in sicer v enem nastopajo kot varianta učitelji in dijaki, v drugem pa poleg učiteljev in dijakov tudi posamezni učitelji. Ta modela sta samo primer za model samovrednotenja učiteljev, kajti možno je izdelati model po želji učitelja. Učitelj si lahko sam izbere želena vprašanja in na osnovi analiz vprašanj se lahko na njegovo željo izdela model za samovrednotenje učiteljev, ki je prilagojen izbranim vprašanjem. Na osnovi analize vprašalnikov so bili strukturirani kriteriji, ovrednoteni, določene so bile zaloge vrednosti in funkcijske koristnosti, opisane variante ter analizirane. V opisani analizi je bil uporabljen računalniški program Dexi in računalniški program Merlin.

Ključne besede: vzgoja, izobraževanje, učitelji, samovrednotenje, kakovost

1 Uvod

Kvalitetnejša izvedba pouka nas vodi v kvalitetnejšo obliko izobraževanja in s tem v dvig kakovosti šole. To je v današnjem času zelo pomembno kot ugotavlja tudi Liston (1999): »Sodobni družbeni procesi in povečana ponudba storitev v izobraževanju zahtevajo od organizacij, ki izobražujejo, da se čedalje pogosteje pojavljajo na izobraževalnem trgu in s tem odzivajo ter hkrati soustvarjajo tržne razmere in konkurenčnost. S tem postaja vedno pomembnejše, da razvijejo jasno vizijo in cilje, s katerimi predstavljajo svojo dejavnost v okolju. Kot ena izmed konkurenčnih prednosti vedno bolj prihaja v ospredje tudi sposobnost izobraževalne organizacije, da zna opredeliti svojo kakovost in jo prenašati v prostor, v katerem živi in deluje.«

Kvalitetna šola je vsekakor tudi uspešna šola. Uspešna šola je antropocentrično naravnana. Svoje učitelje in učence ceni, spoštuje in upošteva. Poleg skrbi za vzdrževanje šolskega poslopja, šolske discipline, uresničevanja šolskega programa, rednega ocenjevanja in šolske administracije uspešna šola še zlasti skrbi za človeške potenciale učencev in učiteljev. Ukvarja se z učenci in učitelji. Učitelj v šoli predstavlja njeno »dušo« in življenje. Druga bistvena in temeljna sestavina šole pa so učenci. Čeprav je na prvi pogled to jasno in očitno, v praksi to pogosto pozabljamo in zanemarjamo. Šola bi morala v učencu razvijati celovitega in ne le delnega človeka, kot poroča Brajša (1995)

Sodelujem v skupini za kakovost na Šolskem centru Velenje in naša naloga je ustvariti kvalitetnejšo šolo, sem spada tudi višja kvaliteta izobraževanja. Učitelj igra eno glavnih vlog v izobraževanju, zato je še bolj pomembno, da izobraževanje izpelje kvalitetno in po želji dijakov oziroma slušateljev. Bolj se učitelji zavemo svojih napak oziroma svojih razhajanj z željami dijakov, tem kvalitetnejše lahko izvajamo učni proces. Pri naši raziskavi smo uporabili elektronski anketni vprašalnik (na področju motivacije in razumljivosti razlage) za učitelje in dijake ter na osnovi rezultatov anketiranja izdelali model samovrednotenja, ki daje učiteljem odgovor na marsikatero njihovo vprašanje, pomagal jim bo na poti h kvalitetnejšemu izvajanju pouka, k večjemu razumevanju z dijaki in prav tako k njihovi nadgradnji izvajanja učnega procesa.

2 Raziskovanje kakovosti izobraževanja na ŠCV

2.1 Izhodišče raziskave in delovna hipoteza

V vse bolj konkurenčnem svetu se tudi področju izobraževanja približuje konkurenčen nastop med šolami in boj za učence, dijake in študente, kot poročata avtorja Sallis (1996) in Mali (2004). V tem boju bodo vsekakor zmagale šole, ki bodo imele kvalitetnejšo izvedbo pouka in s tem tudi boljši kader. Za to, kakšno je merilo oziroma kako oceniti neko šolo, pa pri nas v Sloveniji še ni podanih natančnih smernic kot ugotavljata avtorja Gerlič (2004) in Wechtersbach (2001). Prav tu smo želeli dodati svoj delček v mozaik sistematičnega preverjanja kakovosti po šolah s pomočjo vprašalnikov zastavljenih dijakom in učiteljem.

V raziskavi so bile zastavljene naslednje hipoteze:
1. Ali so postavljeni vprašalniki primerni za analizo kakovosti izobraževanja?
2. Ali analiza vprašalnikov vpliva na samoevalvacijo učiteljev?
3. Ali se z analizo vprašalnikov spreminja kakovost izobraževalnega procesa?
4. Osnovna delovna hipoteza je, da je na osnovi kazalnikov, ki izhajajo iz vprašalnikov, možno razviti odločitveni model za samoevalvacijo učiteljev, kar vodi v povečano kakovost izobraževanja.

2.2 Opis problema

Oblikovati in izbrati moramo primerne vprašalnike za učitelje in dijake, ki bi pripomogli k samovrednotenju učiteljev ter razviti odločitveni model za samovrednotenje učiteljev, kar vodi v povečano kakovost izobraževanja.

2.3 Cilji in namen raziskave

Cilj raziskave je ugotoviti, ali so zastavljeni vprašalniki, ki dajejo želene rezultate, dobro izbrani in zastavljeni ter jasno interpretirani tako učencem, kot učiteljem. Namen raziskave pa je izdelati takšen vprašalnik in model, ki bo s pomočjo analize v pomoč samovrednotenju učiteljev ter izboljšanju kakovosti izobraževalnega procesa, v našem primeru na področju motivacije in razumljivosti razlage.

## 2.4 Metodologija dela

2.4.1 Delo z dokumentacijo

Proučena je bila domača in tujo literatura, ki je povezana z navedenim problemom.

2.4.2 Tehnika ankete

Anketiranje smo izvedli preko interneta s pomočjo elektronskih obrazcev v sodelovanju s PIA d. o. o. Velenje, ki je lastnik programa Merlin, za katerega je prejel srebrno priznanje GZS Savinjsko-šaleške regije. Program Merlin je sistem za spletno zbiranje podatkov, vsebuje elektronske obrazce in analize. Slika 1 prikazuje domačo stran PIA d.o.o

Izvedli smo protokol kampanje (usklajene aktivnosti, ki potekajo v določenem časovnem obdobju z namenom ugotoviti in zagotoviti kakovost izobraževanja) po terminske načrtu (pripravila ga je skupina za kakovost po šolah skupaj z ravnateljem šole) v naslednjih korakih kampanje:
1. Priprava načrta kampanje (cilji, kazalci, področja, sodelujoči oddelki, učitelji, predmeti, dijaki, čas anketiranja); pri tem smo upoštevali zasedenost računalniške učilnice, razpored razrednih ur, anketiranje pred poukom ali po njem. V skupini za kakovost je bil tudi učitelj računalništva, ki je bil prisoten pri izvajanju anketiranja. Urnik anketiranja je bil pravočasno objavljen na oglasni deski za dijake, v zbornici, na spletnih straneh, vsi učitelji pa so ga dobili v nabiralnik in po e-pošti.
2. Seznanitev učiteljskega zbora z načrtom kampanje.
3. Postavitev računalniške podpore anketiranja (potrebna gesla, vprašalniki).
4. Vabilo učiteljem na skupno anketiranje, je potekalo na pedagoški konferenci. Vabilo je bilo učiteljem dano v nabiralnik in poslano po e-pošti, posebej so bili z njim seznanjeni razredniki sodelujočih oddelkov.
5. Preverili smo delovanje e-vprašalnika in obvestili upravitelja administrativnega sistema o izvedbi anketiranja (dan pred anketiranjem).
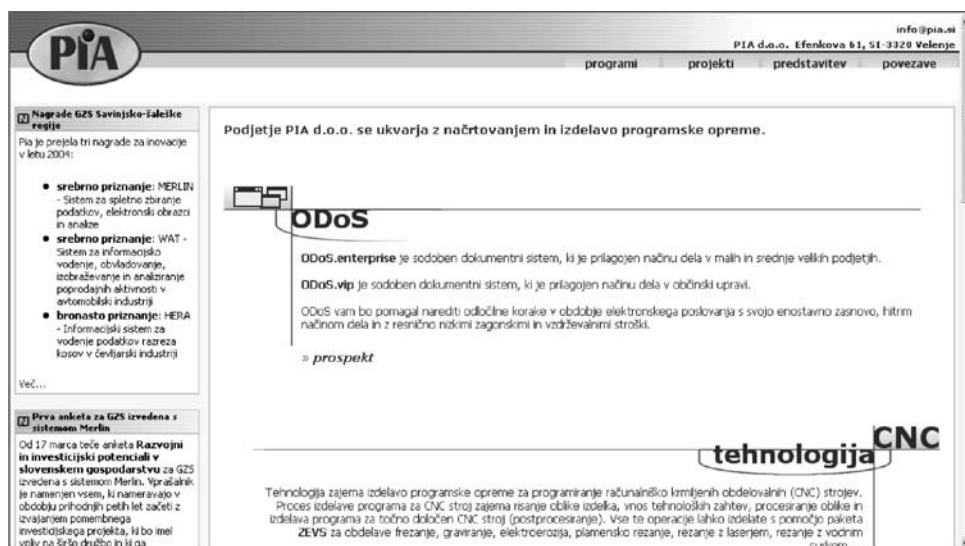
Slika 1: Domača stran PIA d.o.o.

6. Pripravili smo računalniške učilnice; učitelj je na dan anketiranja pred prihodom dijakov v učilnico pripravil računalnike in vnesel potrebna gesla.

7. Anketiranje dijakov: vsak dijak je izpolnjeval vprašalnik na svojem računalniku v računalniški učilnici. Če je število dijakov presegalo število računalnikov, smo anketiranje izvedli v dveh skupinah. Pri izvedbi anketiranja sta bila prisotna dva nadzorna učitelja (član skupine za kakovost in učitelj računalništva) oziroma učitelj računalništva kot član delovne skupine za kakovost. Nadzorni učitelj je poskrbel za nemoteno izpolnjevanje vprašalnikov (pojasnil morebitne nejasnosti, poskrbel za pravilno uporabo vprašalnikov). Dijaki so lahko po opravljenem anketiranju primerjali svoje odgovore z odgovori ostalih dijakov.

8. Anketiranje učiteljev: pri izvedbi anketiranja učiteljev na pedagoški konferenci sta bila prisotna dva člana skupine za kakovost oziroma učitelj računalništva kot član delovne skupine za kakovost. Ker so učitelji izpolnjevali vprašalnike za dijaki, jim je bil takoj po izpolnjevanju nuden vpogled v rezultate anketiranja dijakov.

9. Izpolnjevanje zapisnika o izvedbi anketiranja: nadzorna učitelja sta izpolnila zapisnik s potrebnimi podatki (datum, čas izpolnjevanja, oddelek, število dijakov, potek izpolnjevanja).

2.4.3 Opis vzorca ankete

Anketna raziskava je bila opravljena na ŠCV po posameznih šolah. Anketiranih je bilo 316 (12,9 % vseh dijakov ŠCV) dijakov in 12 (5,3 % vseh strokovnih delavcev) učiteljev.

Vzorec so sestavljali :

■ trije oddelki dijakov in trije profesorji iz SSG,

■ pet oddelkov dijakov in učiteljev iz PTERŠ,

■ dva oddelka dijakov in učitelja iz PTRŠ,

■ trije oddelki dijakov in učitelji iz PTSŠ,

■ dva oddelka dijakov in učitelja iz PTŠSD,

■ dva oddelka dijakov in učitelja iz VSŠ.

Anketiranje smo izvedli na naključnem vzorcu dijakov in učiteljev. Starost dijakov je bila od 15 do 20 let, učiteljev pa od 25 let dalje. Pripravljenost dijakov na anketo je bila prav presenetljiva, prav tako pa tudi učiteljev. Anketna raziskava je potekala nemoteno.

2.5 Modeliranje odločitvenega znanja s pomočjo ekspertnega sistema DEXi

V Tabeli 1 so prikazani vprašalniki in kazalniki za Dexi.

2.6 Analiza rezultatov anketnih vprašalnikov

Sodelujoči učitelji v projektni skupini so ocenili izvedbo projekta (izvedba projektnih dejavnosti, organizacija, pretok informacij) kot učinkovito in dobro. Veseli zlasti ocena, da so imeli na razpolago podrobne in aktualne informacije o poteku projekta (običajno prav informiranost predstavlja eno glavnih ovir pri podobnih aktivnostih na Šolskem centru).

V projektu smo uporabljali metodo samovrednotenja kot osnovno sredstvo za vpogled v delo učiteljev. Metoda samovrednotenja temelji na anketah kot pomembni metodološki sestavini in na prostovoljnem pristopu udeležencev, omogoča vrednotenje lastnega dela in spremljanje kvalitete za lastno dejavnost ter obenem vzpodbuja željo po izboljšanju.

Analiza rezultatov anketiranja je bila izvedena takoj po zaključku anketiranja. Delna analiza je prikazana v

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Tabela 1: Vprašanja in kazalniki za DEXi

Št.vpr.	Vprašanje	Kazalniki za DEXi
		Motivacija
		Načrtovanje
1.	Učitelj skupaj z nami načrtuje snov, ki jo bomo obravnavali.	Snovi
2.	Učitelj skupaj z nami načrtuje, kako bomo med poukom delali.	Pouka
		Ocenjevanje
1.	Učitelj nas pri delu vzpodbuja in bodri.	Vzpodbuda
2.	Učitelj me graja, če ne dosežem tega, kar zmorem.	Graja
		Razumljivost
		Razlaga
1.	Učiteljevo razlago sem razumel.	Razumevanje
2.	Če prosimo, nam učitelj snov razloži še enkrat.	Ponavljanje
		Znanje
1.	Učitelj snov črpa iz več virov in jo predstavi primerjalno, tako, da lahko dijaki primerjamo informacije iz različnih virov in vire primerjamo in vrednotimo.	Informacija
2.	Pri tem učitelju se moram sam/-a dokopati do znanja.	Samoučenje

Tabeli 2. Učitelji so dobili takojšnjo povratno informacijo o svojem delu ter primerjali svoje delo z delom drugih učiteljev, prav tako so tudi dijaki dobili vpogled v mnenje ostalih dijakov in ocenili odstopanje svojega mnenja od mnenja sošolcev.

Medsebojna primerjava odgovorov dijakov in učiteljev omogoča primerjalni vpogled v potek pouka, kakor ga ocenjujejo dijaki v primerjavi z učitelji. Izhodiščna hipoteza pred izvedbo anketiranja je bila, da so pogledi na pouk dijakov in učiteljev različni, pri čemer bi bilo v želji po zagotavljanju kakovosti dobro uskladiti obojestranske poglede na pouk. Končno smo učitelji v službi zaradi dijakov in moramo upoštevati njihovo vrednotenje svojega dela, ga po potrebi prilagoditi oziroma spremeniti ter tako prispevati k dvigu kakovosti nasploh.

2.6.1 Analiza anketnih vprašalnikov vseh dijakov in vseh učiteljev

Tabela 2: Analiza: povprečje vseh učiteljev / povprečje vseh dijakov

	Število anketirancev	Ocena	
Učitelj skupaj z nami načrtuje snov, ki jo bomo obravnavali.			
Dijaki	316	2.78	
Učitelji	12	1.78	
Učitelj skupaj z nami načrtuje, kako bomo med poukom delali.			
Dijaki	316	2.78	
Učitelji	12	2.00	
Učitelj nas pri delu vzpodbuja in bodri.			
Dijaki	316	3.12	
Učitelji	12	4.33	
Učiteljevo razlago sem razumel.			
Dijaki	314	3.46	
Učitelji	10	3.66	

2.7 Poročilo ekspertnega sistema DEXi – učitelji in dijaki

2.7.1 Opredelitev problema

Med poukom v razredu pogosto prihaja do razhajanj med učitelji in dijaki. Učitelji imajo izoblikovan svoj način dela, svojo metodologijo in pogled na določen predmet, prav tako je tudi izvajanje pouka v njihovih rokah. Učitelji ne vedo, ali dijake dovolj motivirajo in tudi ne vedo, ali je njihova razlaga razumljiva. Pogosto si dijaki želijo novih metod poučevanja, nov pristop k predmetu in tudi izvajanju pouka. Želijo si večje motivacije s strani učiteljev, dostikrat pa tudi razumljivejšo razlago. Kako upoštevati njihove želje, če ne vemo, kaj si želijo, kako razumejo razlago, ali so dovolj motivirani?

Cilj je bil, na osnovi kazalnikov, ki izhajajo iz vprašalnikov, izdelati takšen model samovrednotenja učiteljev, ki bo v veliki meri pripomogel k izboljšanju izvajanja pouka, izboljšanju podajanja snovi ter motivaciji dijakov.

Model lahko prilagajamo na potrebe oziroma želje učiteljev. Pogosto učitelji slutijo svoje napake, vendar jih je potrebno ovrednotiti, interpretirati in tako lahko s pomočjo povratne informacije izboljšajo kvaliteto izvajanja pouka in s tem kvaliteto šole.

2.7.2 Določitev kriterijev

Za doseganje kakovosti izobraževanja v srednjih šolah so odgovorni vsi udeleženci življenja šole.

Pri odločanju o kakovosti izobraževanja in dvigu kakovosti šole je potrebno vključiti:

- učitelje, kot izvajalce izobraževalnega procesa,
- svetovalnega delavca šole, ki lahko posreduje potrebne podatke,
- tajnico šole, ki lahko posreduje potrebne podatke,
- strokovnjaka s področja teorije odločanja,
- strokovnjaka s področja pedagogike in didaktike,
- predstavnike dijakov oziroma dijaške skupnosti,
- Center RS za poklicno izobraževanje,
- Ministrstvo za šolstvo in šport republike Slovenije.

2.7.3 Strukturiranje kriterijev

Zaradi preglednosti, medsebojne odvisnosti in povezav je kriterije smiselno strukturirati. Iz spiska kriterijev napravimo drevesno strukturo vsebinsko združenih kriterijev, ki predstavlja ustrezni miselni vzorec.

Večletna pedagoška praksa nam je narekovala kriterije, ki so podrobno opisani v Drevesu kriterijev, ki ga prikazuje Slika 2.

Iz vprašalnikov smo izbrali kazalnike, za katere menimo, da bistveno vplivajo na kakovost izobraževanja. Njihovo pomembnost smo razvrstili po lastni presoji.

Na začetku smo izpostavili motivacijo, ki jo sestavljata izvedbena kriterija: načrtovanje in ocenjevanje.

Načrtovanje sestavljata kriterija:
- **snovi,** ki nam pove, ali učitelj skupaj z dijaki načrtuje snov, ki jo obravnavajo,
- **pouka**, ki nam pove, ali učitelj skupaj z dijaki načrtuje, kako bodo med poukom delali.

Ocenjevanje sestavljata kriterija:
- **vzpodbuda,** ki nam pove, ali učitelj pri delu dijake vzpodbuja in bodri,
- **graja,** ki pove, ali učitelj dijake graja, če ne dosežejo tega, kar zmorejo.

Nato sem izpostavila razumljivost, ki jo sestavljata izvedbena kriterija: razlaga in znanje.

Razlago sestavljata kriterija:
- **razumevanje,** ki ugotavlja, če je dijak razumel učiteljevo razlago,

- **ponavljanje,** ki ugotavlja, če učitelj ponovi razlago, če ga dijak prosi.

Znanje sestavljata kriterija:
- **informacija,** ki nam pove, ali učitelj črpa snov iz več virov in jo predstavi primerjalno, tako da lahko dijaki preverjajo informacije iz različnih virov in vire primerjajo in vrednotijo,
- **samoučenje**, ki ugotavlja, ali se je potrebno pri učitelju dijaku samemu dokopati do znanja.

2.7.4 Določitev zalog vrednosti kriterijev

Orodje DEXi omogoča, da so zaloge vrednosti določene z naravnimi opisi ocene kriterija.

Zaloge vrednosti kriterijev smo uredili od najmanj zaželene do najbolj zaželene, pri kriteriju samoučenje smo uredili zaloge vrednosti od najbolj zaželene do najmanj zaželene.

2.7.5 Določitev funkcije koristnosti: odločitvena pravila

Funkcije koristnosti določajo medsebojni vpliv kriterijev na vrednost nadrednega kriterija. Pomembna lastnost ekspertnih sistemov je KAJ – ČE analiza. Ta omogoča, da z minimalnim trudom preverimo, kako bi bila ovrednotena neka varianta, če se ji spremeni vrednost pri enem ali več kriterijih kot poročata (Krapež idr. 2003). V spodnji tabeli je prikazana tabela pri spremembah vrednosti kriterijev: motivacije in razumevanja.

2.7.6 Opis variant

Varianti sta učitelji in dijaki, ki na podlagi analize vprašalnikov kažejo vrednosti posameznih kazalnikov in jih primerjajo med seboj. Tako dobimo stična mnenja in mnenja, ki se razhajajo med učitelji in dijaki.

DEXi   Stran 1

Drevo kriterijev

Kriterij	Opis
Ocena	Ocenjujemo motivacijo in razumljivost
Motivacija	ugotavljamo motivacijo dijakov
Načrtovanje	Ugotavljamo kakšno je načrtovanje snovi in pouka
Snovi	načrtovanje snovi
Pouka	načrtovanje pouka
Ocenjevanje	ugotavljamo ali so dijaki ocenjeni z vzpodbudo ali grajo
Vzpodbuda	ugotavljamo vzpodbudo dijakov
Graja	ugotavljamo grajo dijakov
Razumljivost	razumljivost razlage in znanja
Razlaga	ugotavljamo ali dijaki razlago razumejo in ali jo učitelj na željo dijakov ponovi
Razumevanje	ugotavljamo ali dijaki snov razumejo
Ponavljanje	ugotavljamo ali učitelj ob prošnji dijakov snov razloži še enkrat
Znanje	ugotavljamo kakšne so informacije dijakov v zvezi z novo snovjo in ali obstaja samoučenje pri dijakih
Informacije	ugotavljamo kolikšne so informacije učiteljev za dijake
Samoučenje	ugotavljamo ali se morajo dijaki sami dokopati do znanja

Slika 2: Drevo kriterijev za model samovrednotenja učiteljev - dijaki

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2.7.8 Analiza variant

Učitelji in dijaki so v našem primeru enako ocenjeni, z zelo dobro oceno 4. Motivacijo imata obe varianti enako ocenjeno, in sicer s 3, kar pomeni, da so učitelji in dijaki enakega mnenja glede motivacije dijakov, prav tako smo ob razumljivosti razlage dobili enake rezultate med učitelji in dijaki. Iz analize je razvidno, da je najslabše načrtovanje snovi in pouka s sodelovanjem učiteljev in dijakov, učitelji premalo upoštevajo želje dijakov. Najbolje je ocenjena razumljivost razlage, kjer so dijaki enotnega mnenja, da učitelji dobro podajajo učno snov.

2.7.9 Interpretacija grafičnih ponazoritev

Eden izmed grafov – Graf 1 prikazuje, da so učitelji dokaj kritični in so mnenja, da skupaj z dijaki zadostno načrtujejo snov, ki jo bodo obravnavali, tudi načrtovanje pouka z dijaki je samo zadostno. Dijaki so ocenili dobro skupno načrtovanje snovi in načrtovanje pouka.

Iz tega lahko sklepamo, da so učitelji dokaj kritični sami do sebe, kar je v našem primeru dobro, saj se bodo na osnovi dobljenih rezultatov potrudili izboljšati sodelovanje z dijaki in skupaj z njimi načrtovali snov in izvedbo pouka, tako se bo dvignila kvaliteta izobraževalnega procesa, predvsem pa načrtovanja pouka.

2.7.10 Odločitev

V našem primeru modela samovrednotenja učiteljev, kjer smo primerjali rezultate učiteljev in dijakov, smo prišli do naslednjih ugotovitev:

- da so učitelji dokaj kritični sami do sebe, kar je v našem primeru dobro, saj se bodo na osnovi dobljenih rezultatov potrudili izboljšati sodelovanje z dijaki in skupaj z njimi načrtovali snov in izvedbo pouka;
- da se morajo učitelji bolj potruditi na področju vzpodbujanja in bodrenja dijakov, saj jih bodo s tem dodatno motivirali in jim pomagali do želenega cilja;
- da se morajo učitelji bolj potruditi pri razlagi snovi;

- da bi se učitelji lahko bolj potrudili pri črpanju virov informacij in dijakom bolj pomagali na poti k znanju.

2.8 Utemeljitev raziskave, predvideni prispevek k razvoju

Naše dolgoletno delo na področju izobraževanje ter sodelovanje s projektno skupino za kakovost nas je privedlo do mnogih vprašanj na področju kakovosti izobraževanja pri nas. Menimo, da je zadovoljstvo dijakov z izobraževalnim procesom velik dosežek učiteljev. Pogosto prihaja do mešanih mnenj, kakšen naj bi bil učitelj, ali je bila razlaga razumljiva, ali je dijak dovolj motiviran in še nešteto vprašanj se porodi, ko človek raziskuje izobraževalni svet. Na ta in podobna vprašanja so odgovarjali dijaki in učitelji. Na osnovi rezultatov anket je bil zgrajen model, po katerem bo lahko vsak posamezen učitelj izvedel svoje samovrednotenje in se tako izognil negodovanju svojih dijakov. S tem bo pripomogel k dvigu kvalitete izvajanja izobraževalnega procesa. Prav tako pa bodo vsi sodelujoči v procesu izobraževanja s pomočjo analize vprašalnikov dobili vpogled, pri katerih predmetih je potrebno izboljšati potek pouka oziroma ali je potrebna dodatna motivacija, ali je razlaga dovolj razumljiva.

Prispevek predstavlja originalni model, ki na osnovi kazalnikov omogoča evalvacijo.

3   Preverjanje hipotez

Prva splošna hipoteza je bila: ali so vprašalniki primerni za analizo kakovosti izobraževanja?

Glede na dobljene rezultate ankete in njihove analize vprašalnikov lahko trdimo, da so vprašalniki primerni za analizo kvalitete izobraževanja, saj smo na podlagi le-teh prišli do željenih rezultatov, analiz, ki bodo vplivale na pozitivne spremembe motivacije in razlage učiteljev.

Druga hipoteza je bila: ali analiza vprašalnikov vpliva na samovrednotenje učiteljev ?

Mnenja smo, da se učitelji s pomočjo samovrednotenja spreminjajo in izvajajo kvalitetnejši pouk. Ta hipoteza bo potrjena pri naslednji kampanji.
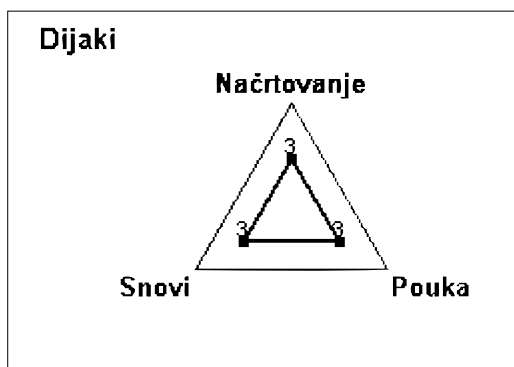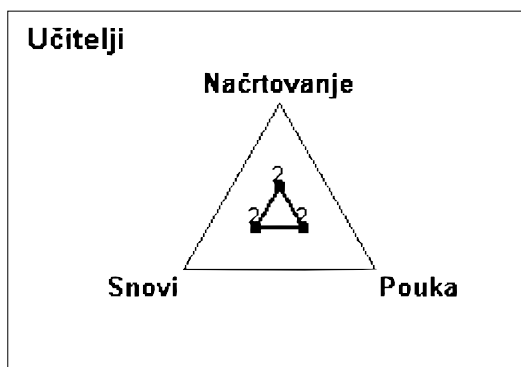
Graf 1: Načrtovanje snovi in pouka - učitelji in dijaki

Tretja hipoteza: se z analizo vprašalnikov spreminja kakovost izobraževalnega procesa?

Ta hipoteza se v tako kratkem časovnem obdobju ne mora potrditi, saj so za spremembe kakovosti izobraževalnega procesa potrebna leta, menimo pa, da smo na pravi poti in ne vidimo ovir, da ta hipoteza ne bi bila potrjena.

Četrta osnovna delovna hipoteza je: da je na osnovi kazalnikov, ki izhajajo iz vprašalnikov, možno razviti odločitveni model za samovrednotenja učiteljev, kar vodi v povečano kakovost izobraževanja.

Razvili smo model samovrednotenja učiteljev, in sicer: model samovrednotenja učiteljev, kjer nastopijo učitelji in dijaki ter model samovrednotenja učiteljev, kjer nastopijo učitelji, dijaki in posamezni učitelj. S pomočjo modela smo interpretirali rezultate analize anket in menimo, da upoštevanje odločitev modelov vodi v povečano kakovost izobraževanja.

4   Zaključek

Na koncu članka bi lahko samo dejali, da je to šele začetek. Začetek novega obdobja v izobraževalnem procesu. Na šoli se zavedamo , da je kvaliteta izobraževanja tista, ki bo dijake povedla k njihovim ciljem in prav tako jih bo privedla v našo šolo, k našim oblikam poučevanja in našim izobraževalnim programom.

Smo na začetku poti, v tej raziskavi je omenjeno le področje izvajanja pouka, nismo pa se še dotaknili:
- preverjanja in ocenjevanja znanja,
- časa za poučevanje in učenje, domačega dela, dejavnosti izven pouka,
- individualizacije pri pouku,
- učnega okolja,
- učne klime,
- izobraževanja in izpopolnjevanja učiteljev,
- učiteljeve vključenosti v delo šole in dejavnosti izven pouka,
- zadovoljstva z delom v šoli,
- šole in staršev ter okolja,
- vodenja šole.

Veliko dela, neprespanih noči, učenja nas še čaka na poti do cilja, do kvalitetnega izobraževalnega procesa.

Za konec bi samo dejali:« Kjer se pot vidi, se lahko tudi prehodi.«

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Mojca Bernik je docentka na Fakulteti za organizacijske vede Univerze v Mariboru. Ukvarja se z raziskovanjem na področju kadrovskega managementa, planiranja kadrov, načrtovanja kariere ter kadrovsko informacijskih sistemov. Svoje delo je predstavila na več mednarodnih in domačih strokovnih in raziskovalnih konferencah in posvetovanjih. Je avtorica ali soavtorica več znanstvenih in strokovnih člankov, objavljenih v domačih in tujih revijah in soavtorica več knjig.

Vladislav Rajkovič je redni profesor in predstojnik Laboratorija za odločitvene procese in ekspertne sisteme na Fakulteti za organizacijske vede Univerze v Mariboru ter raziskovalni sodelavec Odseka za inteligentne sisteme na Institutu "Jožef Stefan". Njegovo področje so računalniški informacijski sistemi s posebnim poudarkom na uporabi metod umetne inteligence v procesih odločanja ter vzgoje in izobraževanja.

Alenka Stanič Lang, Tanja Urbančič

Trends that will Shape the Professions of the Future Information Society

In this paper we discuss the trends in present society that will have the most important influence in shaping future jobs, with an emphasis on issues related to sustainable development and an information society. We point out that based on the requirements of educated end-users, companies will have to follow the principles of sustainable development and social responsibility. In future, due to technical development, natural resources, environmental issues and demographical trends in the developed western world, the most attractive jobs will be in high technology, health and medical care, as well as the pleasure and free time industry. The most important sectors will be informatics and telecommunication, logistics, safety, healthcare and life-long education.

Key words: information society, knowledge management, end-user, sustainable development, socially responsible companies, jobs of the future

Vanda Rebolj

E-education between Pedagogical and Didactic Theory and Practice

Education systems confront new requirements to become more efficient and contribute more to the economic success of society. At the same time there are new challenges for the education systems to perform their tasks using advanced technology. In capacity, information technology considerably surpasses the current learning technology. Supported by Internet it creates an electronic parallel to the standard school and learning. Unfortunately there is only sporadic evidence that supported by information technology, learning and education system as a whole can be considerably improved. In spite of that, we believe there is no way back and e-education is not just a temporary whim. Even though we do not know exactly who should perform what and to which scope. The passiveness of pedagogues, the lack of empirical research and the occurring expansion of the market for e-education products without their quality assessment is not of advantage to this progress. The spread of e-education production without considering the professional opinion of pedagogues, who beside their practical work must also engage in developing their own pedagogical theory, might not benefit the existing education achievements. On the other hand, didactics can by analogy be applied also in the web environment, consequently creating the related assessment mechanisms of the electronic education elements.

Key words: Didactics, e-education, informatization, IT, information technology, multimedia, interactivity, knowledge quality

Jasminka Zloković, Metod Černetič, Olga Dečman Dobrnjič

Children and Virtual Reality – Some dilemas of Education

Possible responses to the extremely complex and delicate question of the influence that «virtual reality» exercises on the development of a child as a unique personality, on the child's psycho-social development and on the education of a child generally may be provided by serious research of a cohort sequential design, either in research programmes in the field of educational sciences or of other social disciplines. The present paper confronts some dilemmas of the modern world. Particularly those between the «traditional» educational values, «obsolete» families and schools and «progressive» education supplied (imposed) by virtual reality that promotes the social standardization of behaviour and the perception of values and of the world around us. The aggressiveness of the mass media in presenting «virtual reality» as « progressive» and without an «alternative» often results in a virtual life for a child, with virtual friends, education and even virtual families. In the time of developing technology, an important question arises: how to deal with such a situation. Do we direct young people to carefully select from what modern virtual reality has to offer and how do we do that?

Key words: virtual reality, education, values, environment, children, family, school

Andreja Rojko, Matjaž Debevc, Darko Hercog

Implementation, Effectiveness and Experience With Remote Laboratory in Engineering Education

Modern educational methods bring many new challenges from the pedagogical, as well as from the technical aspect. One of the more significant is the integration of information and communication technology into the educational process. These is particularly noticeable in the engineering education where the requests of the industry for a faster and more efficient acquisition of knowledge and practical skills lead to a constant search for new solutions in the learning process which would attract and motivate students, as well as be user friendly. This is especially difficult to be reached with the practical education which is usually composed of laboratory exercises that are bound to a specific time and place. One of the possible solutions are the remote laboratories which offer the possibility of the implementation of real remote laboratory experiments in the educational institutions' laboratories and, therefore, enhance the students' knowledge and capability for dealing with some technical problems without the need for their physical presence in the laboratory. In the article, the example of a successful implementation of the remote laboratory in the field of engineering, developed and operating in the Moodle environment, is presented. The laboratory does not only represent the framework for the experiment implementation, but it also offers courses with complete documentation, therefore courses can be performed on distance. As an example, the case of the most widely used course from remote laboratory is presented, i.e., the "Control of nonlinear mechanism" course. Special attention is given to the description of

the booking process for remote experiments, the execution of remote experiments and the applied user interface. The evaluation of the interface usability from the point of view of end users was performed via the acknowledged SUMI method. Additionally, another questionnaire was prepared in order to investigate the students' opinion about working in the remote laboratory. The results have shown that the presented remote laboratory is user friendly and accepted by both teachers and students as a suitable and interesting supplement to the conventional laboratory exercises.

Key words: Remote laboratory, Mechatronics, Usability evaluation.

Rado Wechtersbach

Digital Competence and its Building Renovation of the Subject Informatic in Grammar School

The renovation of the grammar school curriculum has also introduced the competences into the pre-university level of the common educational system. The article comprises the historical background of the competences and their introduction into the educational system in the USA and Europe. Since the definition of the competences has still not been equally presented in Slovenian professional sphere, the following operative definition provides a basis, comprehended within the renovation of the subject Informatics in the grammar school curriculum and consequently its building and evaluation.

Key words: Competence, education trends, informatics, grammar school

Danica Vuković, Eva Jereb

Education Model According to Lisbon Strategy in Public Administration

The abstract highlights adult lifelong learning, which now finally attained the appropriate place in the educational system, thanks to Lisbon 2000 strategy. In the research on adult education we wanted to acquire information on employee needs, obstacles and motivation that accompany them while enrolling in training. It has been ascertained that employees do not comprehend formal education due to financial reasons, their workload and family matters. On the other hand they do attend shorter educational programs of informal education and further training. These methods of learning are often financed and supported by employers and are carried out during their working hours. In majority of cases employees usually have needs for professional training according to their field of expertise, foreign languages and current IT. By forming such an educational model, we strive to enable employees to gain basic skills. These have been recognised as key points in developing economy by Lisbon strategy and model's fundamental grounds stand on knowledge.

Key words: lifelong learning, Lisbon strategy, employed, educational model

Peter Purg

Student Workload and Motivation in Web-Supported Education

The article presents and questions the issue of student workload and learning motivation, especially in the context of recent so called Bologna curriculum renewals. Therein it focusses especially on the web-supported, i. e. blended form of learning. Through a comparison of three simultaneous blended deliveries of the course „Multimedia" at three different higher vocational schools in Slovenia, and with description of selected good-practice examples, recommendations are given for a future-oriented, active use of new ICT in education – from curriculum-development thorugh blended forms of assessment and quality assurance, to didactical methods, e. g. use of forums, wikis, online materials and resources (also multimedia), and other forms of e-learning. From the perspective of decreasing the workload for both teacher and student as well as simultaneously increasing the learning effectiveness and motivation, the article originally attempts at sketching an interactive model for decreasing workload through blended learning.

Key words: workload, actual, motivation, learning effectiveness, e-learning, blended, practice

Denis Čaleta

Distance Learning in to Processes of Education Relatin Area of Counter Terrorism

New asymmetric threats influence on development of new education approaches in to framework of process countering terrorism. Finding that human and his ability for planning and adapting to changes in environment is key factor of success organization. Appropriate educated and trained human is the most important source of efficient process of countering terrorism. Radical changes in to world security environment and progress in to development of informational and communicational technology with enlargement of knowledge is together with enforcement criterion of global market one of the most important factors which shaping modern society, society of knowledge and new modern technological. National security subjects have to realize that education theirs members is one of the most important factors for success of organization. It is obviously that in to this environment doesn't exist united consensus about how educate future counter terrorism experts, but already exist some alternative ideas and ways to do it. Chances for expressing critical thinking on area of research phenomenon of terrorism is one of the basic condition for efficient further development of this research area. Knowledge and abilities of members of this organization are become one of the critical factors for their efficiency in to process of countering terrorism. For these reasons is very important that organizations are aware of facts that it is important to constantly invest in to improvement of knowledge and abilities of their members. Application of new models educations among which we can also put distance learning, could be efficient way for achievements of planning goals.

Key words: countering terrorism, distance learning, information and communication technology.

Lijana Martinc, Mojca Bernik, Vladislav Rajkovič

Teachers' Self-evaluation Model

The article presents a model that can be used as a tool for teacher's self-evaluation. On the basis of this model the teachers will be able to self-evaluate, define and improve the critical areas of their teaching, which will result in the improved overall quality of the teaching process. Two exemplary models have been created. In the first one the teachers and the students represented a variant. In the second model the variant included individual teachers too. The two models serve just as examples for teachers' self-evaluation because the model can be adjusted according to the individual requirements of the teacher. The questions can be selected by the teacher and a new model for self-evaluation, adjusted to the particular set of questions and their analysis can be created. The analysis of the questionnaires served as a basis for the evaluation of the structured criteria, determination of the values, functional benefits and description of the variants and their analysis. The software used in the analyses was Dexi and Merlin.

Keywords: upbringing, education, teachers, self-evaluation, quality.

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