Ana Babić MEcon
University of Rijeka, Faculty of Economics
Ivana Filipovića 4, 51 000 Rijeka
Phone: 00385 51 355 181 Fax: 00385 51 212 268
E-mail address: ana.babic@efri.hr

Slavomir Vukmirović, Ph.D.
University of Rijeka, Faculty of Economics
Ivana Filipovića 4, 51 000 Rijeka
Phone: 00385 51 355 153 Fax: 00385 51 212 268
E-mail address: vukmirovics@gmail.com

Zvonko Čapko Ph.D.
University of Rijeka, Faculty of Economics
Ivana Filipovića 4, 51 000 Rijeka
Phone: 00385 51 355 152 Fax: 00385 51 212 268
E-mail address: zvonko.capko@efri.hr

ROLE OF INFORMATION AND COMMUNICATION TECHNOLOGY IN LIFELONG LEARNING FOR EMPLOYEES IN PUBLIC ADMINISTRATION

ULOGA INFORMACIJSKO KOMUNIKACIJSKIH TEHNOLOGIJA U CJELOŽIVOTNOM UČENJU ZA DJELATNIKE U JAVNOJ UPRAVI

ABSTRACT

This paper discusses the meaning, role and concepts of lifelong learning and information and communication technology in the context of achieving rapid and effective adaptation of employees in public administration. IT education in business can be represented as a combination of academic and professional knowledge, skills and abilities that allow satisfying business needs and performing tasks in line with business requirements.

Lifelong learning is an important step in the life of every individual that is now readily available, and can mean a major breakthrough in professional work or a complete change of business orientation. Lifelong learning refers not only to the time and training on the job, but also includes the time before, during and after the working life of every individual who care about their cultural, social and professional development. Capacity development of Croatian public institutions is supported through a number of important projects in the field of information and communication technologies at the national level. Career development and promotion in the civil service is closely associated with continuing academic education or professional training in the areas related to the workplace but also increasingly popular lifelong learning, especially in the field of ICT.

The use of ICT offers the possibility of innovative methods of teaching and learning, using publicly available services, and professional collaboration worldwide. ICT Competency as a form of lifelong learning includes safe and convenient use of ICT in work, leisure and communication. This technology allows the use of the Internet, digital content, electronic media, personal computers, mobile phones, electronic ATM, electronic books, digital television, etc. ICT Competency is associated with logical and critical thinking with highly developed skills of information management and advanced communication skills.Due to the rapid technological development, well-

planned and quality training is essential primarily of employees of public institutions, and then the user to be able to understand, apply and use new technological solutions.
*An example of this is **e-Administration**, which necessarily involves the use of information technology to increase the availability and facilitate the execution of public services for the benefit of citizens, business owners and employees in these services.*

***Key words:** lifelong learning, ICT, public institutions*

SAŽETAK

U radu se razmatraju značenje, uloga i koncepti cjeloživotnog učenja, ICT-a u kontekstu ostvarivanja sposobnosti brze i učinkovite prilagodbe djelatnika u javnoj upravi. Informatičko obrazovanje u poslovanju se može predstaviti kao kombinacija akademskih i profesionalnih znanja, sposobnosti i vještina koje omogućavaju zadovoljavanje poslovnih potreba i obavljanje zadaća u skladu s poslovnim zahtjevima.
Cjeloživotno učenje je važan korak u životu svakog pojedinca koji je danas lako dostupan, a može značiti veliki napredak u profesionalnom radu ili potpunu promjenu poslovne orijentacije. Cjeloživotno učenje se ne odnosi samo na vrijeme i edukacije na poslu, već obuhvaća vrijeme prije, tijekom i poslije radnog vijeka svakog pojedinca koji brine o svom kulturnom, društvenom i profesionalnom razvoju. Kroz nekoliko važnih projekata s područja informacijsko – komunikacijske tehnologije na državnoj razini podupire se razvoj kapaciteta hrvatskih javnih institucija. Razvoj karijere i napredovanje u državnoj službi usko je povezano sa nastavljanjem akademskog obrazovanja ili stručnom izobrazbom u području povezanim s radnim mjestom ali i sve popularnijim cjeloživotnim učenjem, pogotovo s područja ICT-a.
Upotreba ICT-a nudi mogućnost za inovacije metoda učenja i poučavanja, korištenja javno dostupnih servisa, te profesionalnu suradnju u cijelom svijetu.
ICT kompetencija kao oblik cjeloživotnog učenja uključuje sigurno i praktično korištenje informacijsko komunikacijske tehnologije na poslu, u slobodno vrijeme i u komunikaciji. Ova tehnologija omogućuje korištenje Interneta, digitalnih sadržaja, elektronskih medija, osobnog računala, mobilnog telefona, elektronskog bankomata, elektronske knjige, digitalne televizije, itd.
ICT kompetencija povezane je s logičkim i kritičkim razmišljanjem s visoko razvijenim vještinama baratanja informacijama i razvijenim vještinama komuniciranja.
Zbog brzog tehnološkog razvoja neophodna je dobro planirana i kvalitetna obuka prije svega djelatnika javnih institucija, a onda i korisnika kako bi mogli razumjeti, primijeniti i koristiti nova tehnološka rješenja.
Javne uprava osim državne uprave obuhvaća lokalnu i područnu regionalnu samoupravu te javne službe kojima je osnivač Republika Hrvatska, a kojima je zajednički cilj zadovoljavanje općih interesa i javnih potreba.
*Primjer za to je **e-Uprava** (engl.**e-administration**) koja nužno podrazumijeva upotrebu informatičke tehnologije kako bi se povećala dostupnost i olakšalo izvršenje javnih službi u korist građana,privrednika, kao i zaposlenih u tim službama.*

***Ključne riječi:** cjeloživotno učenje, ICT, javne institucije*

1. Introduction

Our research study has been structured of six interrelated parts to best present and implement the results.
After the introduction, in the second part of our work titled "ELECTRONIC BUSINESS IN PUBLIC ADMINISTRATION OR E-GOVERNMENT" we discuss development and establish the main target groups that can be distinguished in e-government concepts.

The third part of "COMPUTER LITERACY" discusses the meaning and levels of computer literacy as a function of e-government. We analized participation of civil servants of the Ministry of Finance in the total number of civil servants in various training programs of the Centre for Professional Training and Development of Civil Servants to determine the importance and recognition of the computer literacy in the public administration.
In the fourth part, "OBJECTIVES OF THE USE OF ICT IN LIFELONG LEARNING FOR EMPLOYEES IN PUBLIC ADMINISTRATION" we have set objectives aimed at achieving excellence in computer literacy in the development of e-government.
The fifth part titled "E-CITIZEN" describes the e-Citizen project designed to enable communication between the citizens and the public sector. We present effects of lifelong learning and discuss development of e-government concepts.
In part six, "METHODOLOGICAL FRAMEWORK FOR USE OF ICT IN LIFELONG LEARNING FOR EMPLOYEES IN PUBLIC ADMINISTRATION" we discuss the European Qualifications Framework for lifelong learning (EQF) and qualification levels in Information Technology as part of the lifelong learning process, and propose a conceptual model of the use of ICT in lifelong learning on an example of business (user) app development.
"Conclusion" is a synthesis of research findings and goals of reserch.

2. Electronic business in public administration (e-government)

2.1. E-Government: Definitions, Development

In parallel with the development of the Internet, different ideas about combining the latest technological developments and their sophisticated application have been suggested in order to use the maximum potential of the Web. Internet-space has become the foundation and basis of organized life. Ideas, plans, administration, operations of various entities, transactions, contacts to databases of the remotest correspondents - all this is unthinkable in the modern world without the Internet and ***e-business***.
The question is: what actually does the term ***e-government*** and ***e-business in public administration*** mean? This concept can be described in several ways:

- ***E-government*** is the provision of services of public administration to citizens and businesses by using information and communication technologies;
- The term ***E-government*** refers to the method of organizing public management in order to increase efficiency, transparency, ease of access and response capabilities to the demands of citizens and businesses;
- From the perspective of technology ***e-government*** refers to the use of information technology (eg. WAN, Internet, mobile computing) by the public authorities, which have the power to change relations with citizens, businesses and other branches of public administration (ministries, agencies);
- From the perspective of customer communications: ***e-government*** aims to provide an easier, cheaper, more transparent interaction between government and citizens (G2C), government and business (G2B) and between government agencies (G2G).

View of ***e-government*** depends on who is describing.
To economy it means fast electronic company registration, electronically managed, systematized cadastral register, publication of tenders or on-line public procurement.
South Korea was the first country to implement the system of electronic public administration in their practice (on 1st November 2002). The citizens of this country had been given access to 4,000 different categories, and were able to make 393 different activities related to communication with the public administration. Shortly afterwards all developed and economically strong country followed her.
At the end of the last century at various symposia began to emerge ideas of single electronic databases, the application of the Internet in the functioning of public administration, common

strategies and plans were adopted at the level of the European Union, and agreements on cooperation on e-government. In December 1999 the European Commission launched the ***eEurope*** initiative "Information Society for All" in order to bring the advantages of the information society closer to all Europeans.

- The initiative has set three key objectives:
- Enabling every citizen, home, school, every business and administration to be present on-line;
- Building a digitally literate Europe, supported by an entrepreneurial culture ready to finance and develop new ideas;
- Ensuring that the whole process is socially inclusive, to build user trust and strengthen social cohesion.

But the first official step in Europe was made in March 2001, in Naples, at the Third Global Forum, entitled "Fostering Democracy and Development Through E-Government" when e-Government project was initiated. Two months later, at the annual meeting of Ministers of the OECD certain conclusions were adopted and it was suggested that the OECD be the coordinator. In November of the same year, the Public Management Committee (PUMA) took over the project management, engaging eminent experts in the field of electronic business, the Internet and public administration. In order to engage in the started process the candidate countries, in June 2001 they launched an initiative for the adoption of the so-called ***eEurope+*** Action Plan 4, which was adopted by the European Council in Goeteburg.

This action plan elaborates identical three objectives set in the eEurope 2002 Action Plan - of course, from the perspective of the candidate countries, with the addition of another, zero goal: The rapid establishment of the foundation of the information society, which includes the accelerated provision of low-cost communications services for all and the adoption and implementation of EU rules (*acquis communautaire*) relevant in the field of information society.

Already from this target is clear that the main task of the eEurope+ Action Plan was that candidate countries reach levels where Member States were at that moment and after that engage with them at an equal footing in the implementation of further goals. The final report on the implementation of the eEurope + Action Plan was launched in February 2004.

The following action plan ***eEurope 2005*** was based on two groups of related activities. On the one hand, it is necessary to stimulate services, applications and content - which is particularly applicable to online public services and e-business, with broadband infrastructure and security measure issues on the other side.

At the beginning e-government and services so provided to citizens were limited to information posted on the website. Then, only the larger influence of e-business on public administration caused expansion take place with an increasing number of various transactions carried out on the model of e-business, where citizens were no longer just passive observers. Unexpectedly strong and rapid development of electronic business primarily accelerated introduction of electronic government in its current form. Electronic business has led to an increasing demand and need for this form of public administration, which led to the fact that it is now almost impossible to imagine functioning of public administration without e-government.

2.2. Target groups of e-government

The concept of e-government can be singled out four main target groups:

G - Government - Public Administration
E - Employee - Employees
B - Business - Business sector
C - Citizen – Citizens

The most common interactions between these groups correspond to the English abbreviations (G2C, G2B, G2G), which should be followed as they have become stabilized in the literature, but also in use.

• **G2G** - Public Administration Service based on an intranet concept. Enables enhanced cooperation between organs of various levels of government and forging partnerships between them, in providing services to citizens and other subjects. From a variety of reasons, the realization of G2G relationships is a key factor in e-government. Most experts agree that governments at all levels must strengthen and enhance their internal systems and procedures before they provide any kind of electronic interaction with the public, ie, citizens and business sector. G2G includes sharing information electronically between employees of the government at national and local level.
• **G2E** - Service used by employees in public administration based on an intranet concept.
G2E provides:

- promptly notifying and the flow of information necessary for daily work (eg. documents stored in the writing- office);
- better mutual communication among employees (chat services);
- submission of legal documents pertaining to new business standards, etc.

• **G2B** - Service for communication between public administration offices and businesses based on the concept of the Internet and Extranet. The basic components are the supply, information, and services. These services facilitate the work of businesses, providing them with verified data and redundant data collection, and creating communication and other essentials for the realization of e-business between them. Government initiatives to businesses attract the most attention, primarily due to the desire and pressure coming from business sector to improve the speed of providing services and yield cost reductions. Although not relying directly on information technology, several different methods of transparent public procurement system is already used in relation to the business sector, which contributes to democratization and gradual change of culture in public institutions. In the later stages of e-government, the government is approaching this group by implementing applications for electronic provision of services which are otherwise provided by non-electronic means (company registration, issuing various certificates and certificates, payment of taxes, registration of employees, payment of social contributions, compulsory health insurance application...).
• **G2C** - Service for communication between public administration offices and citizens based on the concept of the Internet. The basic components are the users, information, online services, and digital democracy. These services facilitate transactions such as applications, renewal of licenses, payment of taxes, issuance of documents (citizenship certificates, birth certificates, marriage certificates,...) and are performed a lot easier in much shorter timeframe. G2C initiatives often use resources such as the website and info kiosks to make the information more accessible. In another aspect, G2C initiatives are reflected in the government itself by effecting a change in the business processes of the organization. Many believe that one of the main goals of G2C initiatives should be the creation of "one-stop shops" - unique places from which people can perform a variety of services, especially those that require the cooperation of several agencies and for which they will not need to contact[1].

3. Computer literacy

Computer literacy is essential to modern life. Computer literacy is defined as the knowledge and ability to use computers and related technology. Information literacy is defined as the ability to know when there is a need for information, to be able to identify, locate, evaluate, and effectively use that information for the issue or problem at hand. Sources of information can take many forms: books, magazines, computers, TV, movie or anything else.
Researches conducted in 2014 in EU have revealed a trend of digital competencies required for as much as 90% of jobs. In today's era, computer literacy is an essential component of information

[1]Vukmirović, S., Čapko, Z., Informacijski sustavi u menadžerskom odlučivanju, Ekonomski fakultet Sveučilišta u Rijeci, Rijeka, 2009.

literacy, especially important as a set of skills needed to find information. Computers have enabled us to have access to information at any time and from any location, and for citizens this is the way to get desired information and documents.
Below is a table showing the interests of employees in public administration for lifelong learning programs through the Centre for Professional Training and Development. In today's market environment a growing part of the business is conducted with the support of information systems. We often find inappropriate and unresponsive methodology for installing information infrastructure that is not adapted to the needs of business. Trained and competent staff is therefore crucial for the functioning of public administration and citizens have the right to insist on professionalism.

Table 1 *Participation of civil servants of the Ministry of Finance in the total number of civil servants in various training programs of the Centre for Professional Training and Development of Civil Servants*

Name of training programs	2008		2009		2010	
	GOVERNMENT		GOVERNMENT		GOVERNMENT	
	M	F	M	F	M	F
Introduction and basics of civil servic*	109	394	212	341	1	11
Combating corruption	44	35	30	28	97	121
Introduction to management and strategic staged . human Resources	31	101	7	44	12	43
Computer literacy **	239	603	84	338	97	276
Languages ***	12	27	18	63	33	46
The training program for employees who want to advance	0	0	0	0	4	8
The program for senior civil servants	19	33	51	62	11	32
TOTAL	454	1193	402	876	255	537

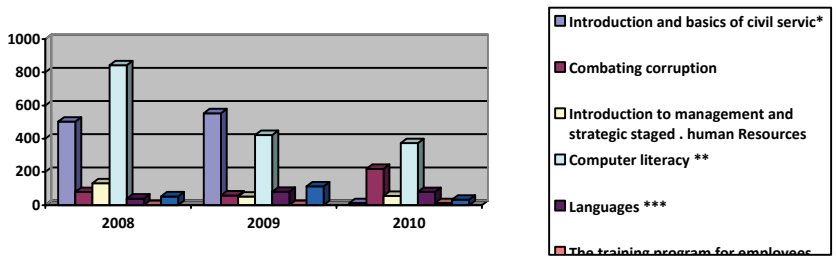
Source: Center for Professional Training and Development of civil servants of the Ministry of Public Administration[2]

This program is an integral part of the general part of the traineeship program; it is therefore compulsory program for new civil servants; It combines 6 different programs for Basic ECDL classes, 7 different programs for Basic ECDL exams, 4 different programs for Advanced ECDL classes, 4 different programs for Advanced ECDL exams and 11 different programs for IT one-day workshops; Total for English, German and French language for basic and advanced courses.
Table 4.1, "Government bodies" includes 20 ministries (Ministry of Economy, Ministry of Health, Ministry of Environmental and Nature Protection, Ministry of Construction and Physical Planning, Ministry of Foreign and European Affairs, Ministry of the Interior, Ministry of Justice, Ministry of Defence, Ministry of Social Policy and Youth, Ministry of Culture, Ministry of Entrepreneurship and Crafts, Ministry of Finance, Ministry of Agriculture, Ministry of Regional Development and EU Funds, Ministry of Maritime Affairs, Transport and Infrastructure, Ministry of Tourism, Ministry of Public Administration, Ministry of Science, Education and Sports, Ministry of Labour and Pension System and the Ministry of the Family, Veterans' Affairs and Intergenerational Solidarity), 20 state administration office (by counties), 4 state office (State Office for State

[2] http://www.dzs.hr/

Property Management, State Office for Trade Policy, Central Procurement Office and Government office for Croats outside of the Republic of Croatia) and 8 state administrative organisations.

Chart 1 *The representation of certain categories of education*



In 2007, an education program was created within the Tempus project for more than 50,000 civil servants aimed at implementing modern technology to develop electronic public administration. EU has awarded 468,620.00 euros to fund the project, and part of the funds in the amount of 25.200,00 euros have been provided by the partners. Styding these data collected four years ago reveal that back then when public administration computerization was initiated to increase its productivity and efficiency, employees realized early the importance of further education considering rapid advancement of technology, and with it the needs of the overall market.
Training programs are typically organized by the National School of Public Administration and a separate organizational unit in a central state body responsible for civil service affairs, in accordance with the Civil Service Training Strategy adopted each year by the Government at the proposal of the central state body responsible for civil service affairs. Special programs can also be organized by relevant central government bodies.
The training of civil servants can be organized and carried out in the country or abroad in the form of lectures, seminars, courses, workshops, studies, roundtables, conferences, exercises and practical work.

4. Objectives of the use of ICT in lifelong learning for employees in public administration

Each educational program is aimed at achieving certain specific goals which provide an idea as to what should be learnt by the person that completes that program and what that person should be able to perform upon its completion, or how that person should behave. These goals must satisfy the general criteria of "quality" goals, ie. they must be precise, realistic and measurable. The goals of strategically oriented information science education are aimed at increasing knowledge and abilities of persons that partake in forming the strategy of the development of informatization, that is, in the strategic processes of introduction and usage of information technology.
Achieving the goals of strategically oriented information science education is a key factor in mastering the relevant strategic knowledge and skills. In the aim of achieving more qualitative and continuous information science education, it is necessary to define educational goals.
The most important teaching goals in information science education can be defined as the following:

- a clear conception of the possibilities offered by computers and computer applications for a given problem area,
- the ability to accept the information science thinking process and the understanding of computer logic in problem analysis,
- an understanding of the logic and the advantages of this new way of solving tasks by the use of modern information technologies,
- the ability to apply knowledge gained at university to the development and the use of applications in dealing with strategic problems,

- the ability to create, sustain and develop one's own user programs (applications) for performing given work tasks,
- a positive attitude about the introduction of information technologies to solving strategic problems and a positive influence on the work environment (for example, groups, teams, management),
- to master the use of a computer and all of its units,
- to master information technology,
- to gain basic information science literacy to the level of solving complex problems in non-structured situations, with the application of information technology,
- to gain and to develop logic and creative abilities in selecting and writing programs in solving non-structured problems, given for a specific problem situation,
- to get introduced to the goals of the society and the dimensions of informatization and information resource management,
- to get introduced to the possibilities and the advantages of network communication,
- to develop the correct relationship towards the use and the protection of programs and data,
- to observe the role of team work in information science[3].

5. E-citizen

For example, we studied a new project of the Croatian Government launched in 2014 with the purpose to enable communication between the citizens and the public sector in a single place on the Internet, through a portal that will include all information about the work of the Government and ministries, information on public services, and will provide secure access to electronic services using electronic identity through one or more acceptable identification credentials, such as a username and password, token, email authentification and others depending on information complexity.
Available e-services in e-Citizen: Rule of Law and Security, Electoral register, Moj OIB (or My Personal Identification Number), mojID (or eID)…
E-Citizen Project is to enable communication between the citizens and the public sector in a single place on the Internet, through a portal that will include all information about the work of the Government and ministries, information on public services, and will provide secure access to electronic services using electronic identity through one or more acceptable identification credentials (username and password, token, digital certificate, etc.).

6. Methodological framework for the use of ict in lifelong learning for employees in the public administration

After analyzing and integrating the concepts of the European Qualifications Framework for lifelong learning and levels (varieties) of knowledge applied to computer education, we propose a conceptual model of the use of ICT in lifelong learning in the case of business (user) application development.

Table 2 *Levels of development of IT education in the context of lifelong learning in the example business (user) application development in public administration*

Level	Learning outcome	Variety
1	Understanding the basic functions, format, commands and rules	Factual
2	Connect features and commands in understanding the application of models and programs	Interpolate

[3] Čičin-Šain, M., Vukmirović, S., Čičin-Šain, M., The Strategic Oriented Information Science Education in the Function of Gaining Strategic Knowledge, MIPRO, 2013 Proceedings of the 36th Intemational Convention, Opatija, 201

Level	Learning outcome	Variety
3	Visual modeling and programming of computer applications in the understanding, connecting and interpreting business models and programs	Interpolate, Operating
4	Using the conceptual methods, techniques and tools in the self-styling simple (general) utility models and programs	Operational
5	The development and use of computer applications in business: financial modeling, investment analysis, optimization and control of urban traffic management, investment portfolio and projects in public administration	Operating, extrapolative
6	Innovative design and development of computer applications synergetic connection of inductive and deductive logic	Extrapolative
7	Targeted development and design aoplikacija in line with business needs extrapolative, Strategic	Extrapolative, Strategic
8	Encouraging flexible, adaptive and integrated development of applications in line with business needs	Strategic

Source : Authors

The EQF will relate different national qualifications systems and frameworks together around a common European reference and its eight reference levels. The levels span the full range of qualifications; from basic (Level 1, for example, certificates to those who drop out of school) to advanced (Level 8, for example, PhD). As an instrument for the promotion of lifelong learning, the EQF encompasses all levels of qualifications acquired in general, vocational and academic education and training acquired in baseline (initial) and permanent (continuous) education and training.
The eight reference levels are described in terms of outcomes (results) of learning. EQF recognizes the differences between different education and training systems and the need for shift to learning outcomes in order to facilitate comparison and cooperation between countries and institutions[4].

7. Conclusion

The levels of IT education development as part of the lifelong learning process have been proposed in accordance with the descriptors defining levels in the European Qualifications Framework (EQF). Each of the 8 levels is defined by a set of descriptors indicating the learning outcomes relevant to qualifications at that level in any system of qualifications. From the viewpoint of the research presented in this paper especially significant are upper (higher) levels (fifth through eighth) related to strategic management activity support in public administration. IT education of managers in public administration as part of lifelong learning is aimed at encouraging the use of computer applications to maximize the chances of acquiring strategic knowledge. Methods of strategically oriented IT education should focus on making suggestions and clues instead of giving direct answers to questions, and solving real-world problems, or specific practical situations.
This paper analyzes the research on the interest of employees in public administration for lifelong learning programs through the Center for Professional Development conducted in the period from 2008 to 2010. Survey results show a high level of awareness of employees and managers in public administration, on the need for computer literacy and strategic-oriented lifelong learning.

[4]EuropeanQualificationsFrameworkforLifelongLearning,(EQF).http://www.asoo.hr/UserDocsImages/dokumenti/eqf.pdf

In designing a methodological framework of the use of ICT in lifelong learning we consider the European Qualifications Framework for lifelong learning (EQF) and levels of knowledge in IT education as part of lifelong learning.
By analyzing and linking concepts of the European Qualifications Framework for lifelong learning and levels of classifications applied to IT education we propose a conceptual model of the use of ICT in lifelong learning on an example of business (user) app development.
The goal of the research is to analyze the role, meaning and concepts of affirmation and development of computer literacy in lifelong learning for employees in public administration and accordingly development a methodological framework for using ICT in informatics education to gaining, development and retaining competencies for performing jobs and tasks in the public administration.

REFERENCES

Bahtijarević-Šiber, F., Management ljudskih potencijala, Golden marketing, Zagreb, 1999
Bloom, S., ATaxonomy for Writing Cognitive ObjectivesSeven Levels of Complexity, http://gfb.cas.psu.edu/EdTech/writtax.htm#top
Čičin-Šain, M., Vukmirović, S., Čičin-Šain, M., The Strategic Oriented Information Science Education in the Function of Gaining Strategic Knowledge, MIPRO, 2013 Proceedings of the 36th Intemational Convention, Opatija, 2013
EuropeanQualificationsFrameworkforLifelongLearning,(EQF).http://www.asoo.hr/UserDocsImages/dokumenti/eqf.pdf
Grgin, T., Školsko ocjenjivanje znanja, Naknada Slap, Jastrebarsko, 1999.
Gugić, I. (et all), Priručnik metodike za nastavu računalstva i informatike, Pentium, Vinkovci, 1997.
Marinović, M. Čičin-Šain, M., Čičin-Šain, S., Predškolsko dijete i računalo, Računala u školi, 2000 MIPRO, XXIII međunarodni skup, Opatija, Hrvatska, 2000.
Official Gazzette (2007): Government's Directive on the forms, methods and conditions for civil servants training
Vukmirović, S., Šehanović, J., Zelenika, R., Žugaj, M, Značenje informacijskog djelatnika u razvoju uredskog informacijskog sustava, V međunarodni simpozij, Zbornik radova, Informacijski sustavi '94, Fakultet organizacije i informatike, Varaždin, 1994.
Vukmirović, S., Čapko, Z., Informacijski sustavi u menadžerskom odlučivanju, Ekonomski fakultet Sveučilišta u Rijeci, Rijeka, 2009.
www.dzs.hr.