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Reasons for and against the use of free and open source software in the primary education in Croatia

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Abstract

Significant financial savings and the reduced share of illegal commercial proprietary software can be achieved through the introduction and use of Free and Open Source Software (FOSS) in primary education. By using FOSS, the latest information and communication technologies become available to everyone, regardless of their financial status. In this paper the authors explore the ICT teachers' interest and their knowledge and use of free and open source software by participating in an on line questionnaire. Authors identify ICT teachers' motivation factors - reasons for (e.g. it is free of charge, easy to obtain, quality) and against (e.g. already using commercial software, it is decreed to use commercial software, students textbooks are based on commercial software) the use of this software in teaching. The primary education computer classroom operating systems market share is also explored. This research was a part of the main scientific research entitled "Analytical Model for Monitoring New Education Technologies for Lifelong Learning" supported by the Ministry of Science, Education and Sports of the Republic of Croatia (Registered Number 227-2271694-1699).

Key words: *school, curriculum, ICT teachers.*

Introduction

The primary education curriculum of the Republic of Croatia does not prescribe, order or decree any specific software for use in teaching. Nevertheless, only commercial proprietary software is presented in ICT textbooks. Significant financial savings and the reduced share of illegal commercial proprietary software can be achieved through the introduction and use of Free and Open Source Software (FOSS) in the primary education.

The term *Free* software was created by Richard Stallman's Free Software Foundation (FSF) (Stallman, 2002) which was formed in 1985 to support the development of the GNU operating system and the onset of redeveloping a whole range of software products based on the concept of free software.

Free software is a matter of liberty, not price. To understand the concept, one should think of free as in free speech, not as in free beer. Free software is a matter of the users' freedom to run, copy, distribute, study, change and improve the software. More precisely, it means that the program's users have four essential freedoms:

- The freedom to run the program, for any purpose (freedom 0).
- The freedom to study how the program works, and change it so it does your computing as you wish (freedom 1). Access to the source code is a precondition for this.
- The freedom to redistribute copies so you can help your neighbor (freedom 2).
- The freedom to distribute copies of your modified versions to others (freedom 3). By doing this you can give the whole community a chance to benefit from your changes. Access to the source code is a precondition for this. (The Free Software Definition; http://www.gnu.org/philosophy/free-sw.html).

The goal of the FSF is to protect the free software from becoming somebody's property and a commercial product. For this purpose a General Public License (GPL) is created that protects access to the source code and free use in contrast to copyright that protects the property rights of software. GPL represents a *copyleft* – protects the freedom of copying, distribution and modification of programs (Feller, 2007, Golden, 2004).

The Open Source Initiative (OSI) (The Open Source Initiative; http://www.opensource.org/), created by Eric S. Raymond and Bruce Perens in 1998, created the new term Open Source which defines the software which is affordable, efficient, reliable, scalable and enables innovation. The most important difference between FSF and OSI is that OSI wishes to participate and collaborate with commercial companies in developing the open source software, which the FSF does not approve. The intention of OSI is to include the professional programmers working in the commercial companies in the process of software development and thereby contribute to higher quality software. (Goldman, 2005).

Despite these differences, most of the free open source software is developed in mutual cooperation between FSF and OSI (Koch, 2005).

FOSS includes the operating system GNU/Linux (with many distributions based on GNU/Linux) and applications like OpenOffice.org, GIMP, Mozilla Firefox, etc. By using FOSS older computers can be re-used and newer will work faster and better. FOSS is generally free and it is free for sharing in accordance with the GNU/GPL license. In this way teachers and students are given a choice of software to be used for their own learning, work and play. FOSS expands the horizons of knowledge. By using FOSS the latest information and communication technologies become available to everyone, regardless of their financial status.

Methodology

The data is collected through an on-line questionnaire on a representative sample of ICT teachers in primary education in Croatia (November 2009 – April 2010).

The basic set (population) consists of N=1062 ICT teachers who work in 832 primary schools in Croatia. With the significance of 95% and a confidence interval of 10%, the required sample size is calculated to be n=89 teachers. The choice of elements in the sample set was performed using a table of random numbers and the statistical data processing was performed using SPSS.

Results and discussion

The percent of ICT teachers who are interested in FOSS is 71, with only 4.3% not explicitly interested (Table 1).

Table 1. *Number of ICT teachers who are interested in FOSS ("Are you interested in FOSS?")*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	66	71.0	71.0	71.0
	Unanswered	13	14.0	14.0	84.9
	I do not have enough information about it	7	7.5	7.5	92.5
	No	4	4.3	4.3	96.8
	Miscellaneous	3	3.2	3.2	100.0
	Total	93	100.0	100.0	

While being interested in FOSS (71%), only 6.5% of ICT teachers are using FOSS in the classroom (Table 2). Among the 6.5%, only 1.1% (1 ICT teacher) is using FOSS operating system **and** applications, while the other 5 out of 6 are using FOSS applications **only** (e.g. OpenOffice.org, Audacity, Mozilla Firefox) with commercial operating systems. These results are based on the data in Table 3 where there is only one instance of using an operating system (GNU/Linux) from the world of FOSS in the ICT classroom.

Table 2. *ICT teachers using FOSS in teaching*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	87	93.5	93.5	93.5
	Yes	6	6.5	6.5	100.0
	Total	93	100.0	100.0	

Table 3. *Operating systems on computers in ICT classroom*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Windows XP	82	89.2	89.2	89.2
	Windows XP, Windows 7	3	3.1	3.1	92.3
	Windows 2000, Windows XP	2	2.2	2.2	94.5
	Windows Vista	2	2.2	2.2	96.7
	Windows 95/98, Windows XP	1	1.1	1.1	97.8
	Windows XP, Linux	1	1.1	1.1	98.9
	Windows XP, Windows Vista	1	1.1	1.1	100
	Total	93	100.0	100.0	

In the ICT teachers' opinion the main reasons for using FOSS (Table 4) are the following: it is free (74 answers out of 93 survey participants, 79.6%), it is easily obtainable (68 responses, 73.1%), and 'It is quality software and it suits my needs' (35 responses, 37.63%). The least important reasons for the use of FOSS are those related to the openness of its source code (a total of 13 answers, 13.98%) and to the fact that someone can contribute to its development (3 replies, 3.0 %). The sum of all responses in Table 4 is greater than the original sample size (93) since the participants replying to the questionnaire could answer the question with more than one choice.

Table 4. *Main reasons for using FOSS*

No.	Reason	Number of responses
1.	It is free of charge	74
2.	It is easy to obtain	68
3.	It is quality software and it suits my needs	35
4.	It is better than commercial proprietary software	13
5.	I feel safer with FOSS - because it does not contain hidden malware	12
6.	I can learn programming on its source code	6
7.	I can access and see its source code	4
8.	I can modify its source code and adapt it to my needs	3
9.	I can contribute to its development	3
10.	Unanswered	12

On the other hand, the main reasons for not using FOSS (Table 5) are: 'I do not need FOSS because I already have a good quality commercially available software' (38 answers, 40.86%), 'I have a specifically decreed commercial proprietary software that I have to use in teaching' (35 answers, 37.63%) and 'If I used FOSS, I would not be compatible with my business associates/partners' (25 answers, 26.88%). ICT teachers

also take into consideration reason 4 which is related to the possible incompatibility of the software at school and at home (25 answers, 26.88%).

One of the main problems for ICT teachers is the contents of the ICT textbooks because they are based entirely on the application of commercial proprietary software. In contrast to that, the primary education curriculum of the Republic of Croatia does not prescribe, order or decree any specific software for use in teaching.

Table 5. *Main reasons for not using FOSS*

No.	Reasons	Number of responses
1.	I do not need FOSS because I already have a good quality commercially available software.	38
2.	I have a specific decreed commercial proprietary software that I have to use in teaching.	35
3.	If I used FOSS, I would not be compatible with my business associates/ partners.	25
4.	The pupilswould use FOSS at school, but at home they will still use a commercial operating system and other commercial proprietary software, so there is a possibility for incompatibility with home assignments files, etc.	21
5.	I do not have time to install and explore FOSS.	5
6.	Lack of literature.	4
7.	I do not have enough information about it.	3
8.	Lack of support for device drivers for the latest devices and computer components.	2
9.	There is a need to know more details about the computer components in order to successfully install a FOSS operating system.	2
10.	There is a lack of good customer support for FOSS or it is nonexistent.	1
11.	FOSS operating system does not have as many available quality office and other applications as one commercial proprietary operating system has.	1
12.	Unanswered.	31

One of the reasons for not using FOSS is the lack of support. Table 6 shows that 86% of ICT teachers do not have access to it or do not know about its availability. This is the problem that needs to be solved, e.g. by creating the FOSS User's Helpdesk by extending the services of the already existing commercial proprietary software helpdesk at the University Computing Centre of the University of Zagreb.

Table 6. *Do you have access to customer support for FOSS?*

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	52	55.9	55.9	55.9
	I do not know	28	30.1	30.1	86.0
	Yes	9	9.7	9.7	95.7
	Unanswered	2	2.2	2.2	97.8
	Miscellaneous	2	2.2	2.2	100.0
	Total	93	100.0	100.0	

Conclusion

There is a significant disproportion between the interest and usage of FOSS among primary school ICT teachers. While there are 71% of ICT teachers who are interested in FOSS, only 6.5% are using FOSS applications in teaching (and only 1.1% with GNU/Linux operating system).

In the opinion of ICT teachers, the main reasons for using FOSS are: it is free, it is easily obtainable and it is quality software.

The main reasons for not using FOSS are: the schools and ICT teachers already possess quality commercial proprietary software; they are under the impression that a commercial proprietary software to use in teaching is decreed (previously mentioned ICT textbooks) and they are insecure about the possibility of file compatibility problems when exchanging files with colleagues/pupils.

ICT teachers have the (wrong) impression that the commercial proprietary software they are using is free, both at school and at home, because the Croatian Government is paying a license fee for all the schools and teachers in the Republic of Croatia. The ICT textbooks should be supplemented and updated by information concerning the FOSS operating systems and applications, possibly in the form of a pdf document because it is less expensive. File compatibility between commercial proprietary software and FOSS is no longer an issue (except in rare cases dealing with very complex content, such as complex tables or formulas).

While there is a problem concerning the official FOSS support, where 86% of ICT teachers do not have access to or do not know if they have available support for FOSS, a partial solution to this already exists in the available FOSS literature.

The literature is available even in Croatian language and online, such as:

- Grundler, Kudumija, Kuzminski: *ECDL Open Source Ubuntu,* http://e-knjiznica.carnet.hr/e-knjige/os-ecdl
- Ivana Bosnić: *OpenOffice.org Writer*, http://www.opensource.hr/files/OpenOffice_Writer.pdf,
- Vlatka Paunović: *OpenOffice.org Calc*, http://www.opensource.hr/files/OpenOffice_Calc.pdf,

– Ivana Bosnić: *OpenOffice.org Impress*, http://www.opensource.hr/files/OpenOffice_Impress.pdf,
– Igor Kos: *OpenOffice.org Base*, http://www.opensource.hr/files/OpenOffice_Base.pdf.

Also, there are millions of FOSS users in the world and everyone can get free online FOSS support at various internet forums and social networks.

This paper indicates that the main reasons for not using FOSS in primary education in the Republic of Croatia are widespread availability of commercial proprietary software influenced by the Croatian Government and the contents of ICT textbooks based entirely on the same software. The author proposes that the Government should follow its own decision made in 2006 (Guidelines to the development and use of open source software in state administration,

http://www.vlada.hr/hr/content/download/13265/151283/file/OSSpolicy_Odrednice.pdf), concerning providing equal opportunities to free open source software in the state administration, including public education.

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Razlozi za i protiv korištenja slobodnog softvera otvorenog izvornog kôda u osnovnom obrazovanju u Republici Hrvatskoj

Sažetak

Uvođenjem slobodnog softvera otvorenog izvornog kôda (FOSS) u osnovno obrazovanje mogu se ostvariti značajne financijske uštede i smanjiti udio nelegalno korištenog komercijalnog vlasničkog softvera. Korištenjem tog softvera svakome postaje dostupna najnovija informacijsko-komunikacijska tehnologija (IKT), bez obzira na njezino/njegovo financijsko stanje. U ovom radu autori istražuju poznavanje, korištenje i interes za FOSS kod učiteljica i učitelja informatike (informacijsko-komunikacijska tehnologija – IKT) u osnovnim školama uz pomoć anketnog upitnika dostupnog putem interneta. Autori identificiraju njihove motivacijske čimbenike – razloge za (primjerice, FOSS je besplatan, lako dobavljiv i kvalitetan softver) i razloge protiv korištenja FOSS-a u nastavi (primjerice, učiteljice i učitelji već koriste komercijalan vlasnički softver, propisano je korištenje takvog softvera, udžbenici za IKT obrađuju komercijalan vlasnički softver). U radu se istražuje i udio korištenih operacijskih sustava u učionicama za IKT u osnovnim školama.

Ovo istraživanje dio je glavnog istraživačkog projekta "Analitički model za nadgledanje novih obrazovnih tehnologija za cjeloživotno učenje" prijavljenog kod Ministarstva znanosti, obrazovanja i športa Republike Hrvatske (projekt broj 227-2271694-1699).

Ključne riječi: *nastavni plan i program, škola, učitelji informatike.*

Uvod

Nastavni plan i program za osnovnu školu u Republici Hrvatskoj ne propisuje koji se softver treba koristiti u nastavi. Međutim, samo se komercijalan vlasnički softver obrađuje u udžbenicima za IKT. Uvođenjem FOSS-a u osnovno obrazovanje mogu se ostvariti značajne financijske uštede i smanjiti udio nelegalno korištenog komercijalnog vlasničkog softvera.

Termin s*lobodan softver* kreirala je organizacija Free Software Foundation (FSF) koja je nastala 1985. godine. Njezin je utemeljitelj Richard Stallman (Stallman, 2002), a zadaća joj je pružiti podršku u razvoju operacijskog sustava GNU i cijelog niza programa koji se temelje na konceptu slobodnog softvera.

Kod slobodnog softvera misli se prije svega na slobodu, a ne na cijenu. Kod toga se misli na slobodu govora, a ne na besplatnost: slobodu korisnika da pokreće, kopira, daje drugima, proučava, mijenja i poboljšava softver. Preciznije, to znači da korisnici slobodnog softvera imaju četiri osnovne slobode:

- sloboda pokretanja programa, za bilo koju namjenu (sloboda 0),
- slobodno proučavanje unutrašnjeg rada programa i slobodno mijenjanje kako bi se prilagodio korisničkim potrebama. Preduvjet za to je raspolaganje izvornim kôdom programa (sloboda 1),
- slobodno kopiranje programa drugima kako biste pomogli svojem susjedu (sloboda 2)
- slobodno kopiranje vlastitih promijenjenih inačica drugima (sloboda 3). Na taj način cijela zajednica može imati korist od vaših promjena. Preduvjet za to je raspolaganje izvornim kôdom programa (Definicija slobodnog softvera; http://www.gnu.org/philosophy/free-sw.html).

Cilj je FSF-a zaštititi slobodan softver kako ne bi postao nečije vlasništvo i komercijalan proizvod. U tu je svrhu kreirana licenca General Public License (GPL) kako bi se zaštitili slobodan pristup do izvornog kôda i slobodna upotreba softvera. Ta licenca je potpuno drugačija od *copyrighta* koji štiti vlasnička prava softvera. GPL predstavlja *copyleft* – štiti pravo kopiranja, distribucije i mijenjanja softvera (Feller, 2007., Golden, 2004.).

Organizaciju *Open Source Initiative* (OSI) (The Open Source Initiative; http://www.opensource.org/), utemeljili su Eric S. Raymond i Bruce Perens 1998. godine, isto kao i novi pojam *Open Source* koji definira softver koji je pristupačan, efikasan, pouzdan, skalabilan i koji omogućuje inovacije. Najveća razlika između FSF i OSI je u tome što OSI želi sudjelovati i surađivati s komercijalnim kompanijama u razvoju open source softvera, a što FSF ne odobrava. Namjera je OSI uključiti u razvoj profesionalne programere koji rade u komercijalnim kompanijama kako bi pridonijeli višoj kvaliteti softvera (Goldman, 2005.).

Usprkos tim razlikama, glavnina slobodnog softvera otvorenog izvornog kôda razvija se uz međusobnu suradnju FSF i OSI (Koch, 2005.).

FOSS se sastoji od operacijskog sustava GNU/Linux (i njegovih mnogobrojnih distribucija koje se na njemu temelje) i aplikacija kao što su OpenOffice.org, GIMP, Mozilla Firefox i druge. Korištenjem FOSS-a starija računala se mogu ponovno koristiti, a nova računala rade brže i bolje. FOSS je uglavnom besplatan i slobodno se smije dijeliti u skladu s licencom GNU/GPL. Na taj način učiteljice/učitelji i učenici imaju mogućnost izbora softvera koji će koristiti za učenje, rad i igru. FOSS proširuje horizonte znanja. Korištenjem FOSS-a najnovije IKT postaju dostupne svakome, bez obzira na njegove financijske mogućnosti.

Metode istraživanja

Podaci su prikupljeni anketnim upitnikom dostupnim putem interneta na reprezentativnom uzorku učiteljica i učitelja informatike u osnovnom obrazovanju u Republici Hrvatskoj (od studenog 2009. do travnja 2010.). Osnovni skup (populaciju) N = 1062, čine učiteljice i učitelji informatike u 832 osnovne škole u Republici Hrvatskoj.

Uz signifikantnost od 95% i razinu pouzdanosti od 10% izračunata je potrebna veličina uzorka od 89 učiteljica/učitelja. Izbor elemenata u uzorak obavljen je uz pomoć tablice slučajnih brojeva, a podatci su obrađenu uz pomoć programa SPSS.

Rezultati i diskusija

Čak 71% učiteljica i učitelja informatike je zainteresirano za FOSS, a samo je 4,3% njih eksplicitno reklo da ih on ne zanima (tablica 1).

Tablica 1.

Iako je čak 71% učiteljica/učitelja ijnformatike zainteresirano za FOSS, samo njih 6,5% koristi FOSS u učionici (tablica 2.) U tih 6,5%, samo 1,1% (1 učiteljica/učitelj) koristi **operacijski sustav i aplikacije** iz svijeta FOSS-a dok ostalih 5 od 6 koriste **samo aplikacije** iz svijeta FOSS-a (primjerice, OpenOffice.org, Audacity, Mozilla Firefox) uz pomoć komercijalnih vlasničkih operacijskih sustava. Ovo se može zaključiti na temelju podataka u tablici 3. gdje se vidi da je samo jedan slučaj korištenja operacijskog sustava (GNU/Linux) u učionici za informatiku.

Tablica 2.

Tablica 3.

Prema mišljenju učiteljica/učitelja informatike, vodeći razlozi za korištenje FOSS-a su sljedeći (tablica 4.): besplatan je (74 od 93 odgovora anketiranih sudionika, 79,6%), lako je dobavljiv (68 odgovora, 73,1%) i "to je kvalitetan softver i odgovara mojim potrebama" (35 odgovora, 37,63%). Najmanje važni razlozi za korištenje FOSS-a su oni koji su povezani s otvorenošću izvornog kôda (13 odgovora, 13,98%) i činjenicom da se može pridonijeti njegovom razvoju (3 odgovora, 3,3%). Zbroj svih odgovora u tablici 4. veći je od izvorne veličine uzorka (93) zato što su sudionici ankete mogli odgovoriti na pitanje s više od jednog odgovora (opcije).

Tablica 4.

Na drugoj strani, vodeći razlozi za nekorištenje FOSS (tablica 5.) jesu: "Ne treba mi FOSS jer već imam dobar komercijalan vlasnički softver" (38 odgovora, 40,86%), "Imam propisan komercijalan vlasnički softver koji moram koristiti u nastavi" (35 odgovora, 37,63%) i "Ako bih koristio FOSS tada ne bih bio kompatibilan sa svojim

suradnicima / poslovnim partnerima" (25 odgovora, 26,88%). Učiteljice/učitelje informatike brine još i razlog 4 koji se odnosi na moguću nekompatibilnost softvera koji se koristi u školi i kod kuće (25 odgovora, 26,88%).

Jedan od glavnih problema za učiteljice/učitelje IKT čini sadržaj udžbenika za IKT budući da su oni temeljeni u potpunosti na primjeni komercijalnog vlasničkog softvera. Međutim, nastavni plan i program za osnovnu školu u Republici Hrvatskoj ne propisuje, ne zahtijeva niti naređuje korištenje nekog točno određenog softvera u nastavi.

Tablica 5.

Jedan od razloga za nekorištenje FOSS-a je nedostatak korisničke podrške. Tablica 6. pokazuje da 86% učiteljica i učitelja nformatike nema ili ne zna ima li korisničku podršku za FOSS. Taj se problem može riješiti, primjerice, proširenjem postojeće podrške korisnicima u Sveučilišnom računskom centru Sveučilišta u Zagrebu (SRCE) za komercijalan vlasnički softver i na područje FOSS-a.

Tablica 6.

Zaključak

Postoji značajan nerazmjer između zainteresiranosti za FOSS i njegovog korištenja u nastavi od strane učiteljica i učitelja informatike u osnovnom obrazovanju u Republici Hrvatskoj. Čak je 71% njih zainteresirano za FOSS, ali ih samo 6,5% koristi aplikacije iz svijeta FOSS-a u nastavi (i samo 1,1% u potpunosti – zajedno s operacijskim sustavom iz svijeta FOSS-a kao što je GNU/Linux ili neka od njegovih distribucija).

Prema mišljenju učiteljica i učitelja informatike za korištenje FOSS-a postoje sljedeći vodeći razlozi: besplatan je, lako dobavljiv i kvalitetan softver. Vodeći razlozi za nekorištenje FOSS-a su sljedeći: škole i učiteljice/učitelji IKS imaju već na raspolaganju kvalitetan komercijalan vlasnički softver, oni imaju osjećaj da im je propisano koji komercijalan vlasnički softver trebaju koristiti u nastavi i nisu sigurni postoji li problem s kompatibilnošću datoteka kada ih razmjenjuju sa svojim kolegama i učenicima.

Učiteljice i učitelji informatike imaju (krivi) osjećaj da je komercijalan vlasnički softver koji koriste u nastavi i kod kuće besplatan budući da licence za njegovo korištenje plaća Vlada Republike Hrvatske.

Udžbenici za informatiku trebaju biti dopunjeni informacijama o operacijskim sustavima i aplikacijama iz svijeta FOSS-a. To ne mora biti nužno u papirnom izdanju – može biti i u elektroničkom (datoteka tipa pdf) i to je onda značajno jeftinije.

Kompatibilnost datoteka više nije problem kod FOSS-a (osim u rijetkim slučajevima datoteka sa vrlo složenim sadržajima – složenim tablicama i/ili formulama).

Još uvijek postoji problem u vezi sa službenom korisničkom podrškom za FOSS gdje korisnici nemaju ili ne znaju imaju li takvu podršku. Međutim, jedno od rješenja čini

svima dostupna literatura u vezi FOSS-a. Takva literatura dostupna je i na hrvatskom jeziku i čine je, između ostalog, sljedeći naslovi:

– Grundler, Kudumija, Kuzminski: *ECDL Open Source Ubuntu,* http://e-knjiznica.carnet.hr/e-knjige/os-ecdl,
– Ivana Bosnić: *OpenOffice.org Writer*, http://www.opensource.hr/files/OpenOffice_Writer.pdf,
– Vlatka Paunović: *OpenOffice.org Calc*, http://www.opensource.hr/files/OpenOffice_Calc.pdf,
– Ivana Bosnić: *OpenOffice.org Impress*, http://www.opensource.hr/files/OpenOffice_Impress.pdf,
– Igor Kos: *OpenOffice.org Base*, http://www.opensource.hr/files/OpenOffice_Base.pdf.

U svijetu postoji više milijuna korisnika FOSS-a i svatko od njih može dobiti, ali i pružiti potrebnu besplatnu pomoć putem raznih internetskih foruma i društvenim mreža.

U ovom se članku pokazuje da su vodeći razlozi za nekorištenje FOSS-a u osnovnom obrazovanju u Republici Hrvatskoj sveopća rasprostranjenost komercijalnog vlasničkog softvera koja je nastala utjecajem Vlade Republike Hrvatske i sadržaj udžbenika za IKT koji se temelje isključivo na tom softveru.

Autori ovog članka predlažu Vladi Republike Hrvatske da postupi u skladu sa svojim odlukama iz 2006. godine (Odrednice razvitka i uporabe računalnih programa s otvorenim kôdom u tijelima državne uprave, http://www.vlada.hr/hr/content/download/ 13265/151283/file/OSSpolicy_Odrednice.pdf), kojima se pod istim uvjetima omogućava pristup i korištenje FOSS-a u tijelima državne uprave, uključujući i obrazovanje.

Ovo istraživanje dio je glavnog istraživačkog projekta "Analitički model za nadgledanje novih obrazovnih tehnologija za cjeloživotno učenje" prijavljenog kod Ministarstva znanosti, obrazovanja i športa Republike Hrvatske (projekt broj 227-2271694-1699).