

The perception of the “English element” in Croatian ICT magazines with undergraduate and graduate computer science students

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Abstract

This paper focuses on the results of a questionnaire distributed to a group of undergraduate computer science students at a Croatian university who had *English in computer science 1 and 2* as ESP mandatory courses and then to a group of graduate computer science students who used to have these English courses. The central part of the questionnaire focused on the “English element” - language borrowings at various levels of orthographical, phonological and morphological adaptation to Croatian and unadapted expressions collected from Croatian information and communications technology (ICT) magazines. The main aim was to establish whether the students from both age groups found the “English element” acceptable in the standard Croatian language of journalistic register and to what extent. The results showed that the “English element” was perceived as predominantly acceptable, and the more adapted the terms were to Croatian, the less acceptable they were, regardless of the students’ age and personal and professional development.

Keywords: language contacts, ESP, acceptability, English element, Croatian ICT students.

Resumen

La percepción del “elemento inglés” en las revistas croatas de TIC en los estudiantes de grados y posgrados de informática

Este artículo se centra en los resultados de un cuestionario distribuido a un grupo de estudiantes de informática en una universidad croata que cursaron los

cursos *Inglés para Informática 1 y 2* como cursos obligatorios de inglés específico y a un grupo de estudiantes de posgrado que cursaron estos cursos de inglés. La parte central del artículo se centró en el “elemento inglés” – préstamos lingüísticos con diferentes niveles de adaptación ortográfica, fonológica y morfológica al croata y expresiones no adaptadas recogidas en revistas de tecnologías de la información y comunicación (TIC). El objetivo principal fue establecer si los estudiantes de ambos grupos de edad encontraron el “elemento inglés” como aceptable en el registro periodístico en lengua croata standard y hasta qué nivel. Los resultados demostraron que el “elemento inglés” se percibió predominantemente como aceptable, y que cuanto más adaptados al croata estaban los términos, menos aceptables eran, independientemente de la edad de los estudiantes o de su situación personal y profesional.

Palabras clave: contacto lingüístico, IFE, aceptabilidad, elemento inglés, estudiantes de TIC croatas.

1. Introduction

Language contacts between English and Croatian are fairly recent when compared with languages such as Italian, German, Hungarian or even Turkish with which Croatian shared a long and cumbersome history. English, unlike the aforementioned languages, has not been the language of a warring and conquering nation and has not been imposed upon the community as a result. English words started entering Croatian after World War 2, but the process has been intensified since the 1990s due to globalization as a large-scale phenomenon in which the English language has a domineering role as a means of communication, notably in ICT.

Languages change, influenced by endogenous or exogenous processes, but they are not independent of their users. “Borrowing is the incorporation of foreign features into a group’s native language by speakers of that language: the native language is maintained but is changed by the addition of the incorporated features” (Thomason & Kaufman, 1988: 37). Every language needs new borrowings especially to meet the requirements of a very demanding and rapidly growing global communication in science and technology, and “the areas of language most receptive to innovation lie on the periphery of the lexical spectrum, i.e. in specialized domains” (Pulcini, Furiassi & González, 2012: 15), such as the ICT field and its “computerese” (Winford, 2003: 58). English ICT terminology is frequent in conversational style among professionals who strive for the fast exchange of turns and

language efficiency where English ICT terms, often opaque to the non-ICT world, serve as a means of in-group identification. Croatia, unfortunately, is not a technological trendsetter, but is, as many other countries, dependent on technology imported from countries which have substantial resources to invest into scientific research and development. Such technologically advanced communities, primarily the USA, devise terms for new referents reflecting their perception of reality by tapping their language system: “The United States has achieved a certain position of dominance in the technological sphere, as competitors fell by the wayside, (...). However, the language in which research on new technology is published is principally English, no matter what the origin” (Wright, 2004: 150). Very often these terms are imported, as cultural borrowings, to receiving languages, such as Croatian, to fill “gaps in the structural inventory of the recipient language” (Matras, 2009: 149) and they stay unadapted as foreignisms (Haspelmath, 2009: 43) or adapted to a point even though “all languages have the means to create novel expressions out of their own resources” (Haspelmath, 2009: 35). Once these terms are accepted and embraced as borrowings by, first, the ICT community, and then by a wider society, they will not be easily replaced by Croatian terms. On the other hand, replacing borrowings by equivalents is important to and indicative of language vitality and of native speakers’ attitude toward their native language (Granić, 2011: 266) if it is to preserve its identity. Therefore, striking a balance between the import of new terms, which facilitates international transfer of knowledge, and creating domestic terminology, which would satisfy professional users, linguists and ordinary people, proves to be a demanding task in language planning and policy (Granić, 2011: 270).

Magazines use journalistic style, one of the five “functional styles”, so called in Slavic stylistics studies, of the standard Croatian language (Silić, 2006). This use of the term partially covers the meaning of “registers”, defined by some linguists as “situationally defined varieties” (Biber et al., 1999: 5) or as “functional variety of language” (Halliday & Matthiessen, 2004: 27). In newspaper register “the language used is carefully edited and revised” (Biber et al., 1999: 9). The sub-register of printed or online computer magazines may be referred to as information and communication technology (ICT) journalistic register.

Croatian ICT magazine texts, on average, are supposed to be informative and written with neutral, non-figurative language resources if they are to be as objective as possible (Silić, 2006: 77; Hudeček & Mihaljević, 2009: 29) and,

as such, are written in the standard Croatian language. Magazines are part of public discourse and the messages they send are public (Kovačević & Badurina, 2001: 101) and available to magazine readers who are not only ICT experts but also ordinary people interested in ICT for various reasons. Journalists and contributors should be aware that readers, consciously or not, internalize their lexis or writing style and thus shape their own language (Hudeček & Mihaljević, 2009: 10-11). Linguistically, a prominent characteristic in Croatian ICT magazines are English-like ICT terms for fairly new extra-linguistic referents but also for some known ones, since “global avenues of communication such as radio, television and the internet (...) have facilitated the spread of vocabulary from (American) English (...) even though the contact is supposedly ‘distant’” (Winford, 2003: 31). English or anglicized ICT terms may be treated as jargonisms or even occasionalisms up to a point; however, when used in magazines, jargonisms tend to spread, quickly gain popularity and eventually enter standard lexis. The intensity with which these terms enter Croatian leaves very little time to Croatian linguists, who strive to comply with the predominantly purist language policy (Barić et al., 1999: 106; Nikolić-Hoyt, 2005: 180), to adapt them to Croatian or to find appropriate Croatian equivalents (Sočanac, 2010: 89). Thus, many English words remain unadapted (Stojaković, 2004; Stojaković & Malčić, 2006). Purism of the Croatian standard language policy does not ban foreign words though it prefers domestic words whenever possible in standard, public and scientific communication (Barić et al., 1999: 104).

1.1. English model adaptation

Numerous expressions entering Croatian from English retain their original orthography, unlike expressions which entered Croatian before transitional processes starting from 1990's. Before that time, original English graphemes would be replaced by closest Croatian ones, so there was a certain degree of orthographic adaptation according to the orthography of the giving language (Filipović, 1990: 28-29; Nikolić-Hoyt, 2005: 189). In the meantime, the number of ESL speakers has risen, so has their proficiency in English; therefore, new entries to Croatian are often not perceived as foreign and unadapted forms are often retained as such (Nikolić-Hoyt, 2005: 183).

Most new expressions enter the receiving language through written media, especially in ICT, and orthography is very often prioritized as a decisive factor in adaptation. Croatian orthography manuals mostly speak in favor of “graphic adaptation”: *Hrvatski pravopis* (Badurina et al., 2007: 217, 237)

recommends that new entries and their subsequent derivations be transcribed with graphemes used for Croatian phonemes. However, if they are written in their original form, they are foreign words. In that case, they should be italicized to mark their foreign origin, as it is also recommended by another *Hrvatski pravopis*, issued by *Institut za hrvatski jezik i jezikoslovlje* (Croatian Language and Linguistics Institute) in 2013. If they are compliant with the Croatian phonetic system, they are considered borrowings and are not italicized. Of course, Croatian equivalents are always preferred to foreign words (<http://pravopis.hr/pravilo/pisanje-opcih-rijeci-i-sveza/46/>).

When words borrowed from English are adapted and integrated at various stages, they become loanwords, Anglicisms, meaning that English phonemes and morphemes are substituted by Croatian ones in the processes of transphonemization and transmorphemization (Filipović, 1986: 68). The English of ICT, especially its American variety, has largely influenced Croatian orthography in ICT magazines. The question is whether the words that appear unadapted in their base form and mostly in print should be categorized as foreign words or as Anglicisms. Nikolić-Hoyt (2005: 181, 189), therefore, finds it necessary to rethink the definition of “Anglicism” since a large number of terms have not undergone these processes and are not Anglicisms in this sense of the word.

In this paper we studied words imported from English into Croatian which have been left unadapted or adapted in various ways, and have entered one register. These words cannot be referred to as “Anglicisms” in every single case, since many of them have not been transformed, and this is the reason why we use the expression the “English element”, used also by Rudolf Filipović in his work, to cover all kinds of English influence upon a language, be it lexical, morphological, semantic, syntactic or phraseological (in Pulcini, Furiassi & González, 2012 “Anglicism” was used as an umbrella term for these influences).

1.2. The native speaker

According to Davies (2003: 210), the native speaker is a person who acquired a L1 in childhood and uses it, “has intuitions (in terms of acceptability and productiveness) about his/her Grammar 1, “and has intuitions about those features of the Grammar 2 which are distinct from his/her Grammar 1” (Grammar 1 - the speaker’s own linguistic system, idiolect; Grammar 2 - the standard language). Naturally, intuition cannot be perceived as the only

criterion when testing the acceptability of some language expression since native speakers' intuition is subjective and depends on the level and quality of their education as well as on their interest in language issues (Barić et al., 1999: 49-50).

We are well aware that students in general, even though native speakers, cannot make acceptability judgments which would be normative and not subject to questioning. Still, they can voice their opinion whether they perceive various linguistic phenomena at the interface of Croatian and English as acceptable (acceptability tests in Davies, 2003; Ellis et al., 2009).

2. Aim

As we teach *English in computer science 1 and 2* as mandatory ESP courses, we wanted to analyze the students' attitudes toward English and Croatian in their professional life. What motivated and finally triggered this research were articles in Croatian ICT magazines where the English element is abundantly present in various forms and at various levels of adaptation. The issue of acceptability and English borrowings in Croatian ICT terminology with the first-year students was only examined in Matić (2014). Other previous research publications (Mihaljević, 1993; Stojaković, 2004) have explored different student groups and used differently designed questionnaires.

The aim of the research and this paper was to find answers to the following questions:

- (i) What is the students' attitude, whose mother tongue is Croatian, toward the English element in Croatian ICT magazines?
- (ii) Do the results in the two groups of students differ and to what extent with respect to their age?
- (iii) Do the results in the two groups differ and to what extent with respect to the quantity of Croatian university textbooks and scientific materials the students had to cover in the course of their studies and to the acquired knowledge, but also with respect to less formal sources of information they encounter in both Croatian and English?

The null hypothesis in this research would be that the students' perception of the English element and, subsequently, acceptability of the collected expressions was unrelated to their age and university education. Taking into account a considerably high exposure of our students to ICT terminology in magazines, Internet articles and mass media, we hypothesized that the students examined in this research would find many of the collected expressions fairly acceptable in newspaper register, but we wanted to establish whether their different age and education would be significant factors and contribute to different results. However, it was not until these results had been statistically processed that we were able to establish the degree of acceptability and the difference between the two age groups.

3. Methodology

3.1. Participants

The examined students completed 4 years of secondary education. The first group of participants in this research were 78 first-year computer science students at a Croatian ICT Faculty, 60 of them male (76.92%) and 18 female (23.08%) (henceforth group 1), who were examined in the second semester of the 2013/14 academic year. They all attended the *English in Computer Science 1 and 2* courses. At that moment, they were at the beginning of the undergraduate university education cycle, which lasts three years.

The second group of participants were 54 second-year graduates of computer science at the Faculty who had completed their undergraduate education. They used to have the abovementioned English courses in the first year of their undergraduate studies, but since then they were exposed to English only in non-educational environments and situations, and usually less formal. In this group, 46 of males (85.2%) and 8 females (14.8%) (henceforth group 2) were examined in the third semester of the 2014/15 academic year. At that moment, they were in their fifth, and last, year of their university education.

According to “the usual methodological expectations of experimental psychology”, as stated in Wasow and Arnold (2005: 1483-1484), the number of participants was sufficiently large so that the research could be carried out and, subsequently, the obtained results processed statistically.

The results of our questionnaire-based research drew on the students' acceptability judgments which they made as native speakers of Croatian who

had developed certain linguistic intuition over the years. These are “primary intuitions”, “simply introspective judgments of a given linguistic expression’s well-formedness or of its meaning” (Wasow & Arnold, 2005: 1482).

3.2. Research instrument

In order to conduct this research, a questionnaire was drawn up and tailored to our purposes. The first part contained questions related to sociodemographic variables (gender, age, completed secondary education) and the students’ attitude toward their knowledge of English, language they read computer texts in, ways of acquiring information on ICT and the reasons for choosing one language over the other.

The second part of the questionnaire contained questions on ICT expressions originating from English. The students were asked to express their opinion on the “English element”, expressions collected from popular Croatian ICT magazines available in print and online. In order to test the students’ perception of acceptability of the English element, we collected a number of expressions which were not graphically marked as foreign words in Croatian texts (by inverted commas, or italicized, bolded or underlined), but were at various levels of adaptation and integration into Croatian. The lists of singular and plural nouns, infinitive verbs, gerunds, adjectives (as examples of direct borrowing) and syntactic calques (examples of indirect borrowing) (Pulcini, Furiassi & González, 2012: 6) represent a reduced amount of what we found, as their quantity or frequency in texts were not the focus of our study. They were sampled from eight issues of the ICT magazines PC-CHIP (issues 223-226 published in 2014) and VIDI (issues 209-213 published in 2013), which can be accessed, for educational purposes, in their digital form through the www.edu.hr website, part of the Croatian academic research network (CARNet). The printed magazines could also be bought at usual points of sale throughout the country. The linguistic expressions were presented randomly and the students did not know what the purpose of the questionnaire was nor were they familiar with any of the papers we referred to in this article.

The students had to provide answers anonymously. The questionnaire took between 30 and 45 minutes to be filled out. The statistical analysis was done with the SPSS software. During the poll, unfortunately, some students did not provide answers to all the questions so the total number of answers and

the number of students who were examined was slightly discrepant in several instances.

4. Results and interpretation

4.1. Questionnaire, part one

The age range of the students in group 1 was between 18 and 25, averaging at 19 (67.94%). The majority of students had attended grammar high school (86%), as opposed to 14% of them graduating from various secondary vocational schools where students usually have fewer English classes per week. The majority of students (60 of them, 76.92%) studied English (a mandatory course) in regular school courses, while 18 of them (23.08%) took additional private courses.

The age range of the students in group 2 was between 21 and 41, averaging at 23 (61.1%). Most of them had attended grammar high school (55.6%), as opposed to 44.4% of them graduating from various vocational schools. Some of them, 38.9%, attended English courses in private language schools, whereas 61.1% had English only in school.

When asked how they found information on breakthroughs in computing (Table 1), the offered options were as follows:

- a) I read manuals/coursebooks from the field
- b) I read magazines from the field (printed or online)
- c) I search the Internet
- d) I talk to my friends/colleagues
- e) something else (state what that is) _____ (no answers)
- f) I don't look for information

Year of study		Offered options					Total
		a	b	c	d	f	
1 (group 1)	No. of students	2	7	51	6	12	78
	% within year of study	2.6%	9.0%	65.4%	7.7%	15.4%	100.00%
5 (group 2)	No. of students	2	6	42	4	0	54
	% within year of study	3.7%	11.1%	77.8%	7.4%	0.0%	100.00%
Total	No. of students	4	13	93	10	12	132
	% in the total no. of students	3.0%	9.8%	70.5%	7.6%	9.1%	100.00%

Chi-Square Tests

	Value	Df	Asympt, Sig (2-sided)
Pearson Chi-Square	9.291 ^a	4	0.054
Likelihood Ratio	13.600	4	0.009
N of Valid Cases	132		

^a4 cells (40.0%) have expected count lower than 5. The minimum expected count is 1.64.

Table 1. Information-finding methods – group1 and group 2 results

The most frequent answer in both groups was “I search the Internet”. Statistically speaking, there is almost a significant difference in their answers (p -value is 0.054, close to 0.05), probably because a number of students from group 1 did not search any information, as they stated in their answers and the students in group 2 never circled the answer “I don’t look for information”. This can be, at least partly, explained by the fact that the group 1 students were still at the beginning of their computer science studies and did not fully develop a habit of self-study for reasons other than obtaining grades, as in high school.

When asked “*When you read texts about computers from books, magazines or Internet websites, what language are the texts in a) Croatian; b) English*”, the answers were as follows (Table 2):

Year of study		Language of texts they read		
		Croatian	English	Total
1 (group 1)	No. of students	23	55	78
	% within year of study	29.5%	70.5%	100.0%
5 (group 2)	No. of students	4	50	54
	% within year of study	7.4%	92.6%	100.0%
Total	No. of students	27	105	132
	% in the total no. of students	20.5%	79.5%	100.0%

Chi-Square Tests

	Value	Df	Asympt. Sig (2-sided)
Pearson Chi-Square	9.561 [*]	1	0.002
Likelihood Ratio	10.628	1	0.001
N of Valid Cases	132		

*0 cells (.0%) have expected count lower than 5. The minimum expected count is 11.05.

Table 2. Language of texts students read – group1 and group 2 results

The students showed statistically different answers (p -value was 0.002, lower than 0.05) and the null hypothesis is proved to be incorrect, that is, during their education students obviously develop different reading habits and use English much more for professional purposes. The group 2 students far more frequently read the texts in English, which explains the students' preference of English and a rather relaxed attitude toward the English element in Croatia, which we are about to discuss. Namely, the language of their search was most frequently English for 50 students (92.6 %), the reason being that texts in English are more available, as they stated. Obviously, even though they do not study English in any formal environment, English has

become a natural tool of search and English texts a natural source of information.

4.2. Questionnaire, part two

4.2.1. Acceptability level

The second part of the questionnaire contained a number of the aforementioned direct and indirect ICT lexical borrowings selected according to their levels of adaptation.

The language question “*Do you find the following forms of Anglicisms acceptable in the standard Croatian?*”, tested the level of acceptability (Mihaljević, 1993: 123-124) of direct ICT borrowings by using a 5-point Likert scale (totally unacceptable-1, mostly unacceptable-2, neither acceptable nor unacceptable-3, mostly acceptable-4, totally acceptable-5). The English translation is provided in parentheses below each expression in tables.

The analysis starts with nouns as the most numerous category of borrowings since the “high borrowability of nouns is thus primarily a product of their referential functions” (Matras, 2009: 168). Table 3 shows the results for a number of nouns in their singular, citation form, phonologically and morphologically partially adapted.

Singular nouns						
Group Statistics t-test					Levene's Test for Equality of Variances	Sig. (2-tailed)
Expression	Year of study	N	Mean			
kontroler (controller)	1	78	4.03		Equal variances assumed	0.390
	5	54	4.19		Equal variances not assumed	0.393
kompajler (compiler)	1	78	4.26			0.833
	5	54	4.22			0.838
tutorijal (tutorial)	1	78	3.45			0.267
	5	54	3.69			0.277
ekstruder (extruder)	1	76	2.32			0.048
	5	53	1.92			0.046
rauter (router)	1	78	2.81			0.000
	5	54	1.80			0.000
hosting (hosting)	1	78	3.74			0.356
	5	54	3.93			0.359
gejmer (gamer)	1	78	3.68			0.046
	5	54	3.19			0.049

Table 3. Acceptability of partially adapted singular nouns - group1 and group 2 results

The figures which we take into consideration are those under ‘equal variances assumed’. The results are similar in most cases, though the group 1 answers show a slightly higher acceptability of more than a half of these 7 partially orthographically and phonetically adapted nouns (but not morphologically, because they keep the English morpheme *-er*) still having a status of compromise replica. The noun which was not favored in either group was *ekstruder*, even less acceptable with group 2. The answers show a statistically significant difference (‘equal variances assumed’: *p*-value is 0.048, lower than 0.05), the reason may be that it was not a common word among the students. Two more nouns, *rauter* and *gejmer*, phonologically, phonetically and orthographically well adapted to Croatian, also show statistically significant varied preferences with the students (‘equal variances assumed’: *p*-value is 0.000 and 0.046 respectively): both nouns rate lower in group 2, and *rauter* is the least acceptable of all. To conclude, group 1 shows a slightly higher acceptability of orthographically and phonetically adapted nouns in singular than group 2, which is statistically significant in three cases.

The question of acceptability also pertained to nouns in plural (Table 4).

Plural nouns						
Group Statistics t-test						
Expression	Year of study	N	Mean		Levene's Test for Equality of Variances	Sig. (2-tailed)
fajlovi (files)	1	78	3.62		Equal variances assumed	0.012
	5	54	3.00		Equal variances not assumed	0.011
overclockeri (overclockers)	1	77	3.56			0.255
	5	53	3.30			0.252
shaderi (shaders)	1	75	3.33			0.501
	5	54	3.48			0.491
gameri (gamers)	1	77	3.61			0.705
	5	54	3.52			0.704
add-onovi (add-ons)	1	78	3.15			0.864
	5	54	3.11			0.864
driveri (drivers)	1	77	4.45			0.857
	5	54	4.48			0.854
game developeri (game developers)	1	78	3.97			0.484
	5	53	4.11			0.479
gadgeti (gadgets)	1	78	4.12			0.763
	5	54	4.06			0.763
tooltipovi	1	78	3.32			0.190

(tooltips)	5	54	3.02		0.195
frameworki (frameworks)	1	77	2.79		0.293
	5	54	3.04		0.290
benjmarji (benchmarks)	1	78	2.82		0.980
	5	54	2.81		0.980
featuri (features)	1	78	2.59		0.236
	5	54	2.87		0.250
webbrowseri (webbrowsers)	1	77	3.70		0.137
	5	54	3.33		0.144
widgei (widgets)	1	77	4.05		0.905
	5	54	4.07		0.902
stickovi (sticks)	1	77	4.03		0.739
	5	54	3.96		0.749
launcheri (launchers)	1	78	3.59		0.494
	5	54	3.44		0.501
teraflopi (teraflops)	1	78	3.17		0.272
	5	54	2.91		0.275
flagshipovi (flagships)	1	78	2.95		0.277
	5	54	2.70		0.284
shooteri (shooters)	1	76	3.33		0.277
	5	54	3.07		0.281
pluginovi (plug-ins)	1	76	4.08		0.676
	5	54	4.00		0.681
streamovi (streams)	1	77	4.30		0.599
	5	54	4.20		0.595
geekovi (geeks)	1	77	4.04		0.802
	5	54	3.98		0.804

Table 4. Acceptability of partially adapted plural nouns - group1 and group 2 results

In most of these examples, the English orthography has been retained and there are no indicators as to the pronunciation. The orthographic exception is *fajlovi*, the only plural noun orthographically, phonologically and phonetically adapted as a compromise replica, and morphologically adapted, since the word receives the inflectional suffixes. However, these English plural nouns may acquire the status of compromise replica owing to the achieved degree of transmorphemization since inflectional suffixes are simply pasted to the English model, some of which retain the English agentive suffix *-er*.

Regarding the attitude on acceptability, the students find these orthographically unadapted forms acceptable and the degree of acceptability is even slightly higher than in singular nouns which were orthographically

better adapted, but no pattern in their preferences, which could indicate some regularity, can be established, that is, why they found the form of e.g. *driveri* more acceptable than *shaderi*. The noun that has been most adapted, *fajlovi*, is even less acceptable with group 2 and the correlation shows a statistically significant difference in the students' answers (p -value is 0.012, lower than 0.05). Two more nouns which have been transmorphemized and which have undergone sibilization, *frameworki*, *benchmarki*, were found to be the least acceptable in both groups. The nouns that were found the most acceptable with both groups were *driveri*, *streamovi*, *gadgeti*, *pluginovi*, and *widgeti*, where the Croatian inflectional suffixes for plural form were simply added to the stem and no other visible changes followed. Of these 22 plural nouns, there were only 6 examples (27.27%) (*shaderi*, *driveri*, *game developeri*, *frameworki*, *featuri*, *widgeti*), plural nouns that have been simply transmorphemized, which the group 2 students rated as more acceptable than the group 1 students. Group 2 found the rest of the plural nouns less acceptable than group 1. In general, the group 1 students again found these forms slightly more acceptable than the group 2 students, even though the difference in the answers of the two groups is not statistically significant, except for one case. We could say that these results are indicative of a certain trend, namely that the group 2 students do not perceive even these orthographically and phonetically unadapted but acceptable transmorphemized forms or maybe they have a more critical viewpoint.

The following table, Table 5, contains the students' acceptability rating of infinitive verb forms at various levels of adaptation to the standard Croatian language.

Infinitive verb forms						
Group Statistics t-test						
Expression	Year	N	Mean		Levene's Test for Equality of Variances	Sig. (2-tailed)
renderirati (render)	1	78	3.37		Equal variances assumed	0.000
	5	54	4.33		Equal variances not assumed	0.000
overclockati (overclock)	1	77	3.64			0.156
	5	54	3.94			0.142
streamati (stream)	1	78	4.04			0.919
	5	54	4.02			0.917
outsourceati	1	78	3.04			0.412

(outsource)	5	53	3.23		0.415
shareati	1	77	3.53		0.985
(share)	5	54	3.54		0.985
uploadati	1	78	4.55		0.594
(upload)	5	54	4.48		0.603
resetirati	1	78	4.68		0.961
(reset)	5	54	4.69		0.960
proguglati	1	78	4.00		0.528
(google up/around)	5	54	4.13		0.529
poskenirati	1	78	3.03		0.728
(scan up)	5	54	3.11		0.731

Table 5. Acceptability of verbs - group1 and group 2 results

Croatian, unlike English, whose “inflectional morphology is sparse” and therefore “absorbs loans easily” (Grant, 2014: 442) has a rich inventory of morphological endings. Verbs borrowed from English are transmorphemized by infinitive formants *-ti*, *-(a)ti*, *-(ira)ti* in order to assume their syntactic function since they are formally different from nouns (unlike many English nouns and verbs which share the same form).

Some of these 9 verbs were orthographically and phonologically/phonetically adapted to Croatian, (*resetirati*, *renderirati*). Some of the verbs have not undergone any transphonemization according to the pronunciation or orthography (*uploadati*, *streamati*, *overclockati*, *shareati*, *outsourcati*), and the verbal aspect, characteristic of Croatian and its cognates can be only contextually determined. The secondary adaptation of verbs with suffixes, prefixes or possibly infixes may indicate the perfective aspect (*proguglati*, *poskenirati*), so these are the verbs which have undergone both transphonemization and transmorphemization, which are no longer perceived as compromise replicas but as verbs formally integrated into the language system.

The verb *resetirati*, which is well adapted to the Croatian phonetic system and has undergone a partial transphonemization, was rated as the most acceptable of all. Another verb, *uploadati*, whose acceptability rating is slightly lower than in the previous example, has not undergone either transphonemization or any orthographic adaptation, but was added the Croatian infinitive ending only and was also perceived as acceptable. A higher acceptability difference is evident between these two verbs and the verb *proguglati*, which is phonetically,

orthographically and morphologically adapted and integrated. On the other hand, another verb which is well adapted, *poskenirati*, has the lowest acceptability rating of all with the examined students, although this verb, as well as the aforementioned *proguglati*, are adapted, express the perfective aspect and have therefore attained a higher, secondary adaptation level. Another orthographically, phonetically and morphologically well adapted verb, *renderirati*, was perceived by group 1 as less acceptable than some unadapted verbs. This is the only instance which shows a statistical difference in answers since group 2 rated it as more acceptable (p -value 0.000, lower than 0.05), as well as other 6 verbs.

Table 6 compares the results of groups 1 and 2 in acceptability ratings of gerunds. In Biber et al. (1999: 66-67) gerunds are classified among “borderline cases of lexical word class membership”. Though derived from verbs, their Croatian form, different from any participial forms, leaves no doubt as to what their function is when they assume nominal position.

Gerunds						
Group Statistics t-test						
Expression	Year	N	Mean		Levene's Test for Equality of Variances	Sig. (2-tailed)
cachiranje (caching)	1	77	3.29		Equal variances assumed	0.126
	5	54	3.61		Equal variances not assumed	0.120
keširanje (caching)	1	78	2.99			0.556
	5	54	3.13			0.561
rootanje (rooting/routing)	1	78	3.74			0.988
	5	54	3.74			0.988
streamanje (streaming)	1	78	3.99			0.833
	5	54	3.94			0.831
tagiranje (tagging)	1	78	3.87			0.874
	5	54	3.91			0.872
flashanje (flashing)	1	78	3.47			0.972
	5	54	3.48			0.972
svajpanje (swiping)	1	77	2.34			0.719
	5	54	2.26			0.720
hakiranje (hacking)	1	78	4.82			0.004
	5	54	4.52			0.010
tagiranje	1	78	3.56			0.061

(tagging)	5	54	3.09		0.071
rutanje	1	78	2.99		0.294
(rooting)	5	54	2.74		0.291
skrolanje	1	78	3.50		0.316
(scrolling)	5	53	3.26		0.318
scrollanje	1	78	3.56		0.003
(scrolling)	5	54	2.83		0.004
trollanje	1	78	3.76		0.003
(trolling)	5	54	3.02		0.004
driftanje	1	78	4.01		0.006
(drifting)	5	54	3.44		0.009
browsanje	1	78	2.92		0.504
(browsing)	5	54	2.76		0.504

Table 6. Acceptability of gerunds - group1 and group 2 results

These 15 gerunds were derived from adapted or unadapted verbs in the process of transmorphemization: the English model was added the Croatian gerund morpheme *-anje* corresponding to the English morpheme *-ing*.

The acceptability range in gerunds is slightly wider than in verbs. *Hakiranje* is the most acceptable form of all and is also orthographically, phonologically / phonetically and morphologically adapted to Croatian, as well as *driftanje*, but the answers of the two groups are statistically different (p -value 0.006), where group 2 found the form less acceptable. *Streamanje*, although morphologically adapted, is neither orthographically nor phonologically/phonetically adapted, but the acceptability average is rather high. The results for another two unadapted gerunds show statistically significant differences, *scrollanje* and *trollanje* (both with p -value 0.003), where Group 2 again chose the unadapted gerund in fewer cases. Both groups found *skrolanje*, the form adapted to Croatian, quite acceptable. The least acceptable in both groups are three orthographically and phonologically / phonetically adapted gerunds (*keširanje*, *rutanje* and *svajpanje*) and one orthographically and phonologically/phonetically unadapted, *browsanje*. Group 1 found 10 cases more acceptable than Group 2.

Table 7 compares the acceptability ratings of adjectives provided by groups 1 and 2.

Adjectives						
Group Statistics t-test						
Expression	Year	N	Mean		Levene's Test for Equality of Variances	Sig. (2-tailed)
gadgetirajuća (gadgeting)	1	78	2.18		Equal variances assumed	0.001
	5	52	1.52		Equal variances not assumed	0.000
bugovita (buglike)	1	78	2.97			0.979
	5	54	2.98			0.979
cross-platformski (cross-platform)	1	78	3.26			0.711
	5	54	3.17			0.710
najgamerskiji (the most gamerlike)	1	78	2.27			0.175
	5	54	1.96			0.163
smartfonoliki (like a smartphone)	1	78	2.05			0.008
	5	54	1.52			0.005

Table 7. Acceptability of adjectives - group1 and group 2 results

These five collected adjectives are derived from unadapted, partially adapted and adapted nouns according to the Croatian word formation rules. “Like nouns, adjectives tend to adopt the agreement morphology of the recipient language” (Matras, 2009: 188), so they have been added derivational morphemes, inflectional morphemes, and the superlative prefix *naj-*. These adjectives, morphologically adapted to Croatian (but not fully orthographically and probably not phonologically and phonetically) were not perceived as acceptable by either group of students. Moreover, group 2 provided lower acceptability ratings in four examples, which in two cases were statistically significant (*gadgetirajuća*, derived from the noun “gadget” and possibly verb **gadgetirati*, *p*-value 0.001; *smartfonoliki*, derived from “smartphone”, *p*-value 0.008). On the other hand, both groups found the least adapted adjectives most acceptable: *bugovita*, derived from “bug” and *cross-platformski*, a hybrid adjective derived from “cross-platform”, where the first part retained English spelling. The listed examples show that a higher level of adaptation and integration into the Croatian language system was on average perceived as less acceptable and that overall acceptability ratings in all categories are somewhat lower in older students.

These were examples of direct lexical borrowings. On the other hand, syntax is often perceived as less receptive or permeable to foreign influence. To prove or reject this common opinion, we collected some juxtaposed

language elements classified as syntactic calques (Mihaljević, 1993: 38) following the English syntax pattern according to which a head noun may be premodified by another noun or, very often, a numeric expression or an acronym. This structure, in which a head noun is postmodified by another noun, a numeric expression or an acronym, is not typical in Croatian. The collected examples consist of mostly Croatian, not foreign sounding words, and as such, this pattern is not as salient in text as a single word.

In Table 8, in the column marked as A, were structures in Croatian collected from ICT magazines. The structures marked as B followed Croatian syntactic rules. Unfortunately, a number of students did not understand what they were asked to do; hence the column was marked with '0'. The question ran as follows: *“In Columns A and B there are pairs of expressions which differ in the word order or part of speech. Choose the expression which you find more acceptable linguistically”*.

No. of ex.	A	B	Year of study	Results						Pearson Chi-square Asymp. sig. 2-sided
				0	A	B	A	B		
1	analogni 3.5mm izlazni priključci	analogni izlazni priključci od 3,5 mm.	1	7	9.0%	51	65.4%	20	25.6%	0.726
				5	3	5.6%	38	70.4%	13	
2	xDSL modem	modem xDSL	1	7	9.0%	67	85.9%	4	5.1%	0.220
				5	4	7.4%	50	92.6%	0	
3	prvi Xperia telefoni	prvi telefoni Xperia, prvi Xperijini telefoni	1	7	9.0%	63	80.8%	8	10.3%	0.927
				5	4	7.4%	45	83.3%	5	
4	iz davnog CRT doba	iz davnog doba CRT- ova (katodnih cjevii)	1	6	7.7%	27	34.6%	45	57.7%	0.412
				5	4	7.4%	13	24.1%	37	
5	naša DVD tema	u našoj temi o DVD-ovima	1	9	11.5%	25	32.1%	44	56.4%	0.713
				5	4	7.4%	17	31.5%	33	
6	pametni telefon G serije	pametni telefon serije G	1	7	9.0%	47	60.3%	24	30.8%	0.921
				5	4	7.4%	32	59.3%	18	

7	monitorima sa 16:10 omjerom stranica	monitorima s omjerom stranica 16:10	1	8	10.3%	30	38.5%	40	51.3%	0.958
			5	5	9.3%	20	37.0%	29	53.7%	
8	u svijetu Android tableta	u svijetu Androidovih tableta	1	7	9.0%	67	85.9%	4	5.1%	0.874
			5	4	7.4%	48	88.9%	2	3.7%	
9	popularna phablet kategorija	popularna kategorija phableta	1	8	10.3%	48	61.5%	22	28.2%	0.818
			5	4	7.4%	33	61.1%	17	31.5%	
10	ASCII kodovi, C funkcije	kodovi ASCII, funkcije jezika C	1	6	7.7%	59	75.6%	13	16.7%	0.661
			5	4	7.4%	44	81.5%	6	11.1%	

Table 8. Acceptability of syntactic calques – group 1 and group 2 results

The results showed that a majority of students from both groups found A structures more acceptable, except for examples 4, 5, and 7 where it was Group 2 that opted for B examples. The difference in the two groups' answers is not statistically significant; however, there is a slightly higher acceptance of A structures in group 2, except for examples 4, 5, and 7. The reasons for acceptance of A examples could be varied: reading English ICT texts, where such syntax is a standard owing to its conciseness, or reading Croatian ICT text whose authors have accepted such syntax transposing it mechanically into Croatian without any adaptation. Finally, the reason could be somewhat longer examples in Column B which could in general contribute to the length of ICT texts that usually tend to be succinct.

4.2.2. Level of (dis)agreement –the use of Croatian and English in the ICT context

The last question was aimed at examining the students' attitude toward English and Croatian terminology and their agreement or disagreement with a number of statements partially taken from Mihaljević (2003, 2006 & 2007) and Halonja&Mihaljević (2012) (Table 9), presented as common misconceptions, and partially from the opinions collected from some of the students during our ESP teaching experience or some ICT professionals. Both age groups had to express their agreement or disagreement with the statements in the table. The question ran as follows: *“The table below contains a number of statements concerning the use of English ICT terms and Anglicisms as well as Croatian ICT terms. Read each statement and by circling a digit on a 5-point scale*

(1=strongly disagree; 2= disagree; 3=neither agree nor disagree; 4=agree; 5= strongly agree) express your agreement or disagreement with the statements”.

Students' attitude						
Group Statistics t-test						
Statements	Year	N	Mean		Levene's Test for Equality of Variances	Sig. (2-tailed)
1) English computer terms are much more precise than Croatian terms – English term precisely describes the concept.	1	77	4.34		Equal variances assumed	0.397
	5	54	4.44		Equal variances not assumed	0.382
2) Everyone knows what an English computer term means-everyone speaks like that.	1	77	4.17			0.488
	5	54	4.26			0.506
3) Croatian terms do not describe the concept precisely.	1	77	3.62			0.502
	5	54	3.74			0.511
4) Accepting English terms will increase and improve the knowledge of English in users.	1	77	4.01			0.802
	5	54	4.06			0.803
5) Croatian terms are often too long.	1	77	3.77			0.241
	5	54	3.98			0.260
6) I use English terms more often when speaking.	1	76	4.43			0.387
	5	54	4.31			0.391
7) Croatian computer terms are sometimes funny.	1	77	4.51			0.821
	5	54	4.54			0.827
8) English terms are more attractive, more prestigious and they sound better.	1	76	4.11			0.801
	5	54	4.15			0.806
9) It is not necessary to create Croatian computer terms when we have English ones.	1	77	3.16			0.042
	5	54	3.65			0.045
10) It is difficult to translate English terms into Croatian because the Croatian language vocabulary is less developed than English.	1	77	2.86			0.654
	5	54	2.96			0.665

Table 9. Students' agreement with statements

The obtained results showed that the students from two different age groups held very similar opinions and that their agreement or disagreement with the statements matched. Statistically significant difference was calculated in one case only, in statement 9 where group 1 more frequently expressed their disagreement with the statement, whereas group 2 agreed with it to a higher

extent, expressing their preference of English. Group 1 did not quite discard Croatian terms at that moment.

In statements 1, 2, 4, 6, 7 and 8 both groups showed a high degree of agreement, slightly higher in group 2. The highest result was reached in Statement 7, which stated that Croatian ICT terms were “funny“. This prevailing attitude may be explained by the fact that the students had already been accustomed to English terms which they had encountered as signifiers of some new ICT referents, they used them as jargonisms, so that every subsequent in(ter)vention of Croatian linguists, already belated from the students’ perspective, might sound inappropriate, or “funny“. Hence their agreement with statement 1, once they have learned the English term for a new referent, every Croatian equivalent is allegedly imprecise, although Statement 3, which is statement 1 rephrased, shows a lower degree of agreement. The prestige that English has in the ICT world is evidently very important to the students since they agreed with Statement 8. Statement 2 is indicative of their perception regarding the wide use of English as the main tool, especially in spoken communication (statement 6). Statement 10 is least agreed with. It seems that the examined students did not completely discard their mother tongue and they did not perceive it as an underdeveloped language, unable to provide means for Croatian ICT terminology.

5. Conclusion

The research was conducted with a view of establishing whether the undergraduate and graduate ICT students of various ages accepted what we called the “English element” in Croatian ICT magazines. We compared the results of the two age groups to determine whether the attitudes toward English and their mother tongue generally changed during their educational process with respect to recommended scientific literature in their curricula and the amount of information they had internalized, formally and informally. The results showed that the “English element” was perceived as acceptable by the students. The difference in answers was prevalingly statistically insignificant except for several isolated cases where mostly Group 2 showed a somewhat less tolerant attitude to both adapted and unadapted forms. Regardless of the students’ personal development and age difference, education in their mother tongue, quantity of Croatian scientific material they had to study and less formal sources of information or

perception of and attitudes toward the English element do not change much over the years and are, as it were, petrified.

The answers also showed that the students' language awareness of Croatian as a language of ICT could be improved. These results could imply that they do not perceive Croatian as a potential LSP, but as a native language not quite appropriate for professional communication. In order to change this perception, "small" languages such as Croatian could be taught as LSPs at engineering colleges with a view of raising awareness of how important it is to create and actively use native terminology, along with classes for academic purposes concentrated on writing skills in scientific register, persuasion and debating speaking skills, which could help native ICT terms obtain a wider circulation.

ESP classes could include more varied translation exercises from English into Croatian to introduce native language expressions to students. This could help them develop a habit of using these expressions in their professional communication instead of resorting to English forms. A number of English ICT terms have already had their Croatian equivalents in dictionaries (Kiš, 2000, or some proposed equivalents found at <http://bolje.hr>, supported by the Croatian Language and Linguistics Institute), so the students should be encouraged to use them. The very fact that Croatian equivalents are not used in the ICT magazines could be a sign of authors' intellectual slackness, snobbism or disregard of Croatian, lack of proofreading service and of preferential treatment of English due to its prestigious status.

The attitudes which the students expressed could help mobilize Croatian linguists to respond to these processes more effectively, but also stir up language policy makers to keep the Croatian language vital and ready to react to new extra-linguistic referents by envisaging changing trends and simulating language future based on present changes both in language and society.

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