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Computer Laboratory in Medical Education for Medical Students

Mira HERCIGONJA-SZEKERES[1], Darko MARINOVIĆ[2], Josipa KERN[2]

[1]Polimedika, Ltd, Zagreb, Croatia

[2]University of Zagreb, School of Medicine, Zagreb, Croatia

Abstract. Five generations of the second year students at the Zagreb University School of Medicine were interviewed through an anonymous questionnaire on their use of personal computers, Internet, computer laboratories and computer-assisted education in general. Results show advance in using the information and communication technology by medical students during the period from 1998/99 to 2002/03. However, their positive opinion about computer laboratory depends on installed capacities: the better technology in the computer laboratory – the more positive opinion of it.

Keywords: medical students, computer laboratory, computer-assisted education

1. Introduction

One of education goals of the Zagreb University School of Medicine (ZUSM) is to train the medical students to become skilful in using the information and communication technologies (ICT) for learning and in their future professional work [1, 2].

How to reach that goal? Our opinion is that the well-organized computer laboratory could be the main prerequisite for it. In 1996 the first computer laboratory was established at the ZUSM, and the students get opportunity to use it for learning or anything they want [3]. So far eight computer laboratories have been established at the ZUSM, distributed on different locations. In order to develop the best ICT environment for the students, we started with noticing the students existing skills and interests for ICT, as well as their attitudes to it. The first e-learning materials at the ZUSM were made for the purpose of learning the Physiology. Therefore the all the second year students had the opportunity and obligation to come to computer laboratory and use ICT (networked PCs linked to Internet). That was the reason that we asked the second year students to fill a questionnaire based on some general information, some interests and experience for ICT and expectation in their future professional life.

The aim of the paper was to find out information on medical students attitudes to ICT, on using the ICT by them (how frequently and for what), and changes in both during the five years.

2. Material and methods

The participants in this study were students of the second year on ZUSM. The paper questionnaires were distributed in the computer laboratories on the ZUSM after one of the lectures.

Out of 537 interviewed students, 212 were male (39,5%) and 325 female (60,5%).

In this paper we analyze results of the research from five successive academic years.

Table 1. Analyzed questions:

Question	Offered answer
1. Sex	M, F
2. Did you use PC before starting your studies on ZUSM:	YES, NO
3. Do you use PC:	a) YES, at home
	b) YES, at ZUSM
	c) YES, both – at home and at ZUSM
	d) NO, as I have no admittance to PC
	e) NO, as I don't know to use PC
	f) NO, as I don't want to use PC
4. How often do you use Internet:	a) several times a day
	b) once a day
	c) few times in the week

		d) few times in the month
		e) less than once in the month
		f) never
5.	For work and fun I use the following programs on PC:	*/free text format/*
6.	Opinion on the computer laboratory:	*/free text format/*
7.	Do you use the PC to help you learn?	YES, NO
8.	Do you have an e-mail address?	a) NO
		b) YES, one
		c) YES, several

Two answers (5 and 6) in the questionnaire were provided in free text format. Such format enables to get more thorough and deep answers [4]. Data processing was performed by French software Le Sphinx 2000, a program specialized for the statistical analysis of questionnaires, especially with open-ended questions. This program enables lexicometric analysis and enables to combine textual data with other data of examinees [5, 6].

3. Results and Discussion

Table 2 shows number of students by the academic year and by sex. It's quite simple to distinguish that there was about 20% more females then males. Considering the fact that there have been more female than male students on ZUSM, it was an expected result.

Table 2. Examinees by academic years and sex

		Academic years					
		1998/99	1999/00	2000/01	2001/02	2002/03	
Sex	male	33	44	51	35	49	**212**
	female	59	57	93	60	56	**325**
		92	101	144	95	105	**537**

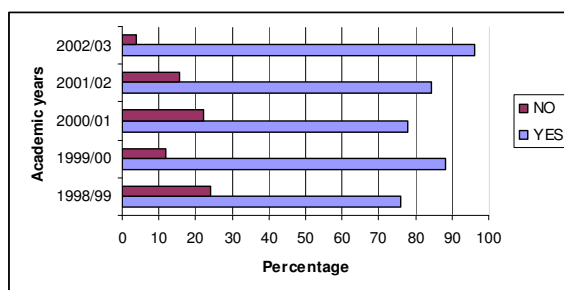Answers on the second question are shown on Figure 1.

Figure 1. Using of PC before studying at ZUSM (in percentage)

The answers to the third question informed us that 82,6% of examined students used PC, mostly (36,4%) at home and at ZUSM. However, it was interesting to notice that in the study period there were some students (2,6%) who didn't want to use PC.

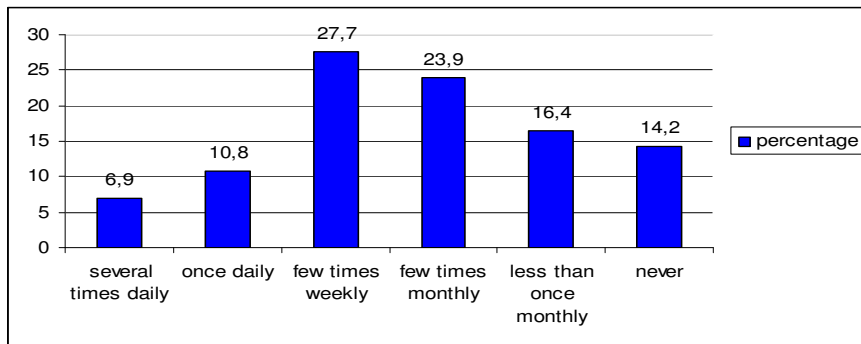Frequency (in percentage) of using the Internet is done on Figure 2.

Figure 2. Using of Internet

Answers to the seventh question showed that 61% of all examined students used the PC for learning.

The eighth question talking about using e-mails showed that the percentage of 32,3% of all students without any e-mail address was very high [7].

For the open ended questions (no. 5 and no. 6) the answers were expected in the free text format. The reason for that was to retain richness in information, and to notice all the programs the students use. The answers were neither coded nor modified (in order not to loose information and characteristics in the vocabulary).

The most frequent words describing the software the students used showed us that the students mostly used word processing and playing games.

Table 3. The most frequent words describing the most frequent software used by students

The most frequent words:		
WORD	92	14,6 %
GAMES	71	11,3 %
WINDOWS	40	6,4 %
INTERNET_EXPLORER	37	5,9 %
WINAMP	25	4,0 %
EXCEL	24	3,8 %
INTERNET	2	3,8

		%
OFFICE	17	2,7%
EXPLORER	16	2,5%
NETSCAPE	16	2,5%
POWERPOINT	14	2,2%
YAHOO	14	2,2%
ICQ	13	2,1%
MEDIA_PLAYER	13	2,1%
SMALL GAMES	12	1,9%
MS_OFFICE	9	1,4%
OUTLOOK_EXPRESS	9	1,4%
CORELDRAW	7	1,1%
DIFFERENT	7	1,1%
PHOTOSHOP	6	1,0%

The results of the correspondence analysis of answers to question "opinion on the computer laboratory" and generations of students (from 1998/99 to 2002/03) are shown on the Figure 3. Both axis at the Figure 3 on their positive sides describe positive opinion of students to computer laboratory (words used to describe it: good, well, useful, OK, perfect …) and negative opinion on their negative sides (used words: relatively, too slow, more, not enough, I don't know, too short time …). It is very interesting that the students from the first two (1998/99, 1999/00) generations expressed negative opinions on computer laboratory, and those from the year 2000/01 had very positive opinion. The reason for such results might be the fact that laboratory was renewed at the beginning of this academic year. It is interesting to notice that the students of the 2002/03 divided their opinion on the computer laboratory. Some of them are satisfied with ICT environment offered by the computer laboratory, but some are not. It can be recognized by positioning of 2002/03 generation on positive side of the firs axis and on negative side of the second one.
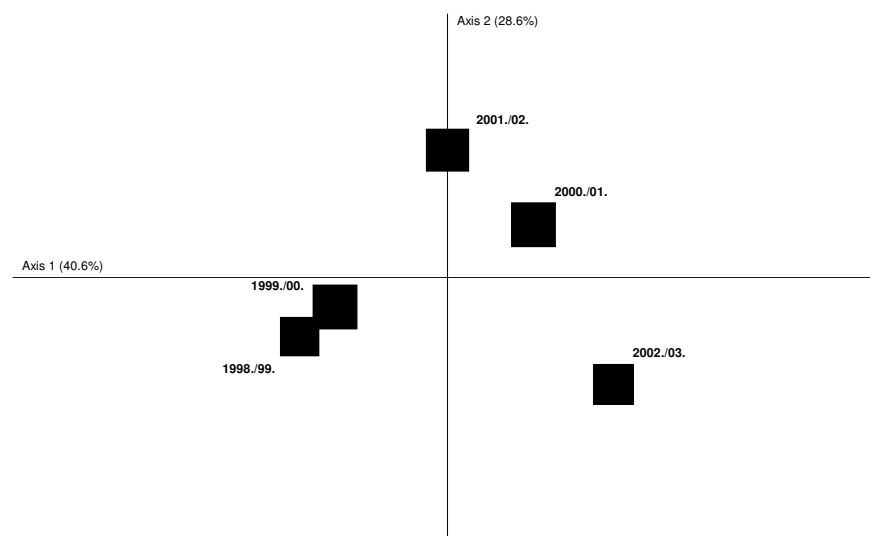

Figure 3. Results of correspondence analysis of questions "opinion on computer laboratory" and "generations"

4. Conclusion

Results show improvement in ICT use (for different purposes) by medical students during the period of five years and their acceptance of it [8]. However, their positive opinion about the computer laboratory depends on installed capacities – the better technology in the computer laboratory, more positive opinion on it.

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