Information Technologies in Education of Medical Students at the University of Sarajevo

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ABSTRACT

Introduction: Information and communication technology have brought about many changes in medical education and practice, especially in the field of diagnostics. During the academic year 2013/2014, at Faculty of Medicine, University of Sarajevo, students in the final year of the study were subjected to examination which aim was to determine how medical students in Bosnia and Herzegovina subjectively assessing their skills of using computers, have gained insight into the nature of Information Technology’s (IT) education and possessive knowledge. Material and methods: The survey was conducted voluntary by anonymous questionnaire consisting of 27 questions, divided into five categories, which are collecting facts about student’s: sex, age, year of entry, computer skills, possessing the same, the use of the Internet, the method of obtaining currently knowledge and recommendations of students in order to improve their IT training. Results of the study: According to the given parameters, indicate an obvious difference in the level of knowledge, use and practical application of Information Technology’s knowledge among students of the Bologna process to the students educated under the old system in favor of the first ones. Based on a comparison of similar studies conducted in Croatia, Sri Lanka, Pakistan and Denmark, it was observed that the level of knowledge of students of the Medical Faculty in Sarajevo was of equal height or greater than in these countries.

Key words: Medical faculty in Sarajevo, medical students, IT.

1. INTRODUCTION

The twentieth century was a revolutionary period in the field of computer science. Today, in the 21st century information technology and computers represent an essential part of every sphere of human life, especially in the process of education and doing bussing. Information and communication technology have brought about many changes in medical education and practice, especially in the field of diagnostics. To catch up with the IT revolution, developing countries need to explore their options, to design and implement major changes in adapting to new computer technologies (1-5).

The aim of this research is to determine how medical students in Bosnia and Herzegovina subjectively assessed their skills of using computers, and have gained insight into the nature of IT education and knowledge possessed in consideration of the fact that Bosnia and Herzegovina is one of the countries in transition.

2. MATERIALS AND METHODS

During the academic year 2013/2014, Faculty of Medicine, University of Sarajevo it was conducted an observational, analytical study. The study included 154 students of the final year of study, 85 of those studying at the Bologna process, and 69 of them attending the old system of education. The survey was conducted voluntary by anonymous questionnaire consisting of 27 questions, divided into five categories, which are collecting facts about student’s: sex, age, year of entry, computer skills, possessing the same, the use of the Internet, the method of obtaining currently knowledge and recommendations of students in order to improve their IT training.
of the Bologna process which is presented in chart 4.

Chart 5 shows the most commonly used capabilities of the Internet and the difference between the systems of study.

13.6% of students in both systems said they had achieved knowledge through a formal education, 3.2% by attending courses, 38.9% by themselves, 2.5% that they were taught by someone else, 18.9% a combination of regular education and independent learning, a full-time education by attending courses and 5.2% and 17.7% a combination of all the previously mentioned features.

43.5% of respondents said they had attended IT courses, 16.8% that they are useful, and 3.2% that they are expensive. 36.7% said that, in their opinion, the information technology will be based in the future on greater use of the Internet, 18.18% on use of databases, 18.18% on use of multimedia, and the rest will a combination of the previously mentioned. Table 1 shows suggestions about improving education in IT.

The average score of students of the old system of knowledge of computer components is 2.73, 3.55 using of Word, Excel 2.3, 3.56 Power Point, Internet 3.5, knowledge of basic computer concepts 2.4, and overall knowledge 3.00. The average score of students in Bologna system of education of knowledge of computer components is 3.07, the use of Word 3.69, 2.53 Excel, Power Point, 3.68, 3.78, and Internet knowledge of basic IT concepts 2.68, and 3.24 overall
knowledge. An average of acquired knowledge of all subjects was 3.12. As the students of the old system, as a part of its study tracked object Medical Informatics, found all of its classes as follows: 13% said that the teaching is "satisfactory", 59% evaluated it as "good", 22% as the "excellent" and 6% are not stated.

**Questionnaire for students of biomedical faculties on use and knowledge of information technology**

| Faculty | 1. Do you use a computer in your work? |
|---------|--------------------------------------|
| Medical | 1. Daily |
| Dentist  | 2. Sometimes |
| Pharmacy | 3. Occasionally |
| Biomedical | 4. Rarely |

| Genre | 1. Male | 2. Female |
|-------|--------|-----------|
| Yes   | 1.2     | 2.1       |
| No    | 1.1     | 2.0       |

**II. GENERAL KNOWLEDGE OF INFORMATION TECHNOLOGY AND COMPUTER USE**

| Question | 1. Do you have a computer? |
|----------|--------------------------|
| Yes      | 1. Daily |
| No       | 2. Occasionally |

| Question | 2. Do you use a computer? |
|----------|--------------------------|
| Yes      | 1. Daily |
| No       | 2. Occasionally |

| Question | 3. Are you familiar with the ability to use a computer at the faculty? |
|----------|---------------------------------------------------------------------|
| Yes      | 1. Daily |
| No       | 2. Occasionally |

| Question | 4. How many times a week do you use the computer? |
|----------|-----------------------------------------------|
| 1 time   | 1. Daily |
| 2 times  | 2. Occasionally |
| 3 times  | 3. Rarely |
| 4 times  | 4. Never |

| Question | 5. Do you have knowledge of the Internet? |
|----------|-----------------------------------------|
| Yes      | 1. Daily |
| No       | 2. Occasionally |

| Question | 6. How do you learn about the computer? |
|----------|---------------------------------------|
| 1. Day    | 1. Daily |
| 2. Even   | 2. Occasionally |
| 3. Rarely | 3. Rarely |
| 4. Never  | 4. Never |

| Question | 7. If you do not use a computer, which is the reason? |
|----------|-----------------------------------------------------|
| I do not have it | 1. Daily |
| I do not need it | 2. Occasionally |
| I do not know how to use it | 3. Rarely |
| I do not have money to buy it | 4. Never |

**III. LEVEL OF KNOWLEDGE ABOUT INFORMATION TECHNOLOGY BEFORE STUDY AT THE FACULTY**

| Question | 1. If you have not attended IT courses, what do you think about them? |
|----------|---------------------------------------------------------------------|
| I do not know about them | 1. Daily |
| I cannot learn much | 2. Occasionally |
| They are too expensive | 3. Rarely |
| Someone else taught me | 4. Never |

| Question | 2. If you attended IT courses, what do you think about them? |
|----------|----------------------------------------------------------------|
| I do not need the courses | 1. Daily |
| I do not know how to use them | 2. Occasionally |
| I do not have time to attend them | 3. Rarely |
| I do not have money to buy the courses | 4. Never |

| Question | 3. If you do not use a computer, which is the reason? |
|----------|-----------------------------------------------------|
| I do not have a computer | 1. Daily |
| I do not have Internet connection | 2. Occasionally |
| I do not have enough money to buy one | 3. Rarely |
| I do not know how to use it | 4. Never |

**IV. EXISTING KNOWLEDGE OF INFORMATION TECHNOLOGY USE**

| Question | 1. Do you use the Internet? |
|----------|---------------------------|
| Yes      | 1. Daily |
| No       | 2. Occasionally |

| Question | 2. Do you know how to use the Internet? |
|----------|---------------------------------------|
| Yes      | 1. Daily |
| No       | 2. Occasionally |

| Question | 3. How do you use the Internet? |
|----------|-------------------------------|
| Chat and/or forum | 1. Daily |
| Browse the web | 2. Occasionally |
| Download | 3. Rarely |
| E-mail | 4. Never |

| Question | 4. Do you use computer programs? |
|----------|--------------------------------|
| Yes      | 1. Daily |
| No       | 2. Occasionally |

| Question | 5. How do you use computer programs? |
|----------|-----------------------------------|
| 1. Day   | 1. Daily |
| 2. Even  | 2. Occasionally |
| 3. Rarely| 3. Rarely |
| 4. Never | 4. Never |

**V. FUTURE EDUCATION IN THE FIELD OF INFORMATION TECHNOLOGIES**

| Question | 1. What would you like to see in future education in the field of information technologies? |
|----------|----------------------------------------------------------------------------------------|
| 1. More theoretical courses | 1. Daily |
| 2. Practical courses | 2. Occasionally |
| 3. Case studies | 3. Rarely |
| 4. Practical work | 4. Never |

**6. What would you like to study at a medical faculty in the future?**

5. What would you like to study at a medical faculty in the future?

**7. What would you like to study at a medical faculty in the future?**

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50. What would you like to study at a medical faculty in the future?

**4. DISCUSSION**

It is revealed by the result of the conductive study that all students have access to a computer and the Internet, and that they have a relatively good knowledge about it. Students of Bologna educational system spend more time by computer than students of the old system (1-4). The results of self-assessment go in favor of students who study at the Bologna process, as a possible reason for this is the average age of life. Students subjectively estimated their knowledge of using Word, Power Point and Internet as the best ones. Use of Excel is minor. The most numbers of respondents acquired their knowledge independently during the regular education, while a small number of them attended IT courses. The largest number of students considered that the improving in IT education that will later be used for a medical professional purposes, will be achieved by greater using of computers, databases and Internet (5, 6).

A similar study was conducted at the Medical University of Rijeka in Croatia in 2005. Average self-assessment carried out by the principle Likert charts with five degrees was 3.39 for skills, 2.69 for knowledge, and IT concepts 3.76. According to these data a relative comparison of the results of these studies can be done, and noted that there was no significant difference in the level of knowledge (1).

The results of similar study in Sri Lanka in 2008 showed that only 77.3 % of respondents own a computer, by contrast to our respondents. The highest level of knowledge students have achieved by one goal formal training, mostly using a computer that represents again the difference with result gained in this. The results of self evaluation knowledge of certain computer programs are identical to the results of these studies (2).

In 2010 the Avicenna Medical College in Lahore, Pakistan also conducted studies similar of character. The study involved assistants, full time and part-time professors. 94 % of respondents possessed knowledge of basic computer concepts. 69 % of respondents said they would like to be able to use word processing programs. Only 47 % of respondents know how to use Excel, 72% of the Internet, and 59 % power point which is a significantly inferior results compared to those obtained by our study (3).

In year 2006 and 2008 professor Izet Masic made a trial at the Medical Faculty of the University of Sarajevo. The answers to the question about using of literature during medical education have indicated that the Internet is of great importance because 36 % of the students in 2006 and 52 % in 2008 had used the Internet for this purpose.

The marks for Medical Informatics obtained by examining are different from those obtained by examining the use of the last (4).

**Figure 1. Questionnaire for students of biomedical faculties on use and knowledge of information technology**
, 80 % use the Internet regularly, and 60 % have Internet access at home, there are large deviations considering to the time of the study (5, 6).

5. CONCLUSION

Results of the study according to the given parameters have indicated an obvious difference in the level of knowledge, use and practical application of IT knowledge among students studying at the Bologna process in relation to the students who are educated under the old system in favor of the first ones. At the same time, by comparison with the available studies, despite of the lack of complete coinciding parameter of estimation, we can see approximately the same level of knowledge of information technology and the application as those show in the results of the study at the Medical University of Rijeka in Croatia, and a significantly higher level of that kind of knowledge of students of the Medical Faculty of the University of Sarajevo in relation to the results of studies conducted in Pakistan. The level of acquired IT knowledge and application of the students from Sri Lanka is as approximate results as those of this study, despite of the fact that it is same acquired mainly through the formal education.

CONFLICT OF INTEREST: NONE DECLARED

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