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The Information Technology Use and Skills by Undergraduate Students: Case Study

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Abstract

Information Technology (IT) is a major part of modern society and is already well embedded in everyday life. IT is believed to be a perfect tool to enhance learning, also at tertiary level. However, it is uncertain whether students use the IT for educational purposes and if that usage is at higher than basic level. The aim of the study was to investigate the use of IT by engineering students and especially their use of technology in the learning process. The study proves that the students are surrounded by common type of IT, such as smartphones and computers, and use them almost constantly. However, its use is not directed towards learning process and especially towards learning engineering applications. The knowledge and skills of programming and specialized engineering software declared by students is astonishingly low for students of engineering faculty. It appears that students' IT ownership, access, and some, although limited, competencies have not translated into use for educational purposes.

Keywords: use of information technology, educational technology, university students, student learning, engineering education

Introduction

Information Technology (IT) is a major part of modern society and is already well embedded in everyday life. It is widely considered to be a perfect tool to enhance learning at all levels, including tertiary education. It is due not only to the advances in computer technology but also to drastic drop in computers' prices and general use of the computers in everyday life (Atif, Chou 2018). However, it is not obvious that students use the IT for educational purposes and whether that application is at higher rather than basic level.

In education, it is often taken for granted that technologies can 'enhance learning'. However, it is always questionable whether technology is used properly as there are reports about very superficial use of IT. The above applies both to students and lecturers (Dincer, Sahikayas, 2011; Hong, Songan, 2011).

Regarding students, it is reported that university students tend to use IT mainly for entertainment and social communication (Edmunds, Thorpe, Conole, 2012; Gasaymeh, 2018). On the other hand, many teachers do not have all the necessary skills to integrate IT in teaching processes.Consequently, thetechnology is used only as a tool to improve the visualization of lectures (Andreu, Nussbaum, 2007).

Advances and prevalence of IT in the society mean that universities must adopt and find possible roles of IT in the education processes; both learning and teaching (Delgado-Almonte, Andreau, Pedraja-Rejas, 2010; Livingstone, 2012). The aim of this study was to assess the use of IT by students and to find how they apply the technology in the learning process.

Subjects & Instrument

The study was conducted at the Faculty of Production Engineering, University of Life Sciences in Lublin, Poland in 2016/2017 academic year. Population consisted of 343 undergraduate students registered for the following programmes: agriculture and forest engineering; transport; management and production engineering; geodesy and cartography.

Data was collected using a pre-tested, semi-structured questionnaire. The questionnaire was developed based on the literature, informal discussion with experts and experience from similar studies conducted in 2009/2010 academic year (Lorencowicz, Kocira, 2009). However, the current survey included several aspects of IT use not investigated earlier. The main difference was inclusion of the general use of IT and also knowledge and application of engineering software.

The survey, which was administered in the middle of the semester, consisted of 40 questions grouped in five sections with the following headings:

1. Respondents' profile
2. Use of Information Technology
3. Information Technology skills
4. Application of Information Technology in the learning process
5. Information Technology attitude and anxiety

Results

Demographic Data

The data was collected from students registered in 4 programmes, ranging from Year 1 to Year 4 of 4-year degree programmes (Table 1). The table shows the age distribution, with the average age of the respondents 21.7 years.

Table 1. Demographics

Degree Programme	%	Year of Study	%	Age	%
Transport	20%	Year 1	20%	< 20 years	7%
Management & Production Engineering	59%	Year 2	30%	20–22 years	41%
Geodesy & Cartography	15%	Year 3	28%	22–24 years	42%
Agriculture & Forest Engineering	6%	Year 4	23%	> 24 years	10%
Total (343)	100%	Total (343)	100%	Total (343)	100%

There were 343 responses, with almost equal distribution in terms of gender; 55% male and 45% female respondents. The most popular IT device was laptop/notebook with 91% of students declaring their use (the survey did not differentiate between laptop and notebook), followed closely by smartphones (85%). The desktop computers showed 31% users and tablets disappointing 16% – Fig. 1. Almost all students use IT either constantly or at least few times a day (98% – Fig. 2).

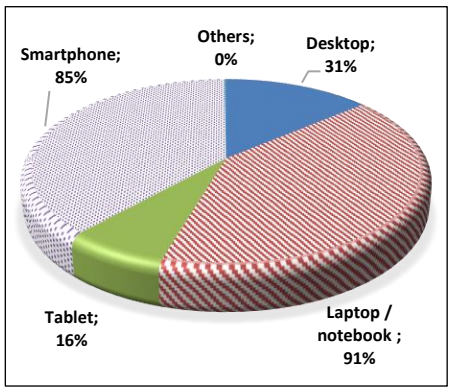

Fig. 1. Type of IT devices used

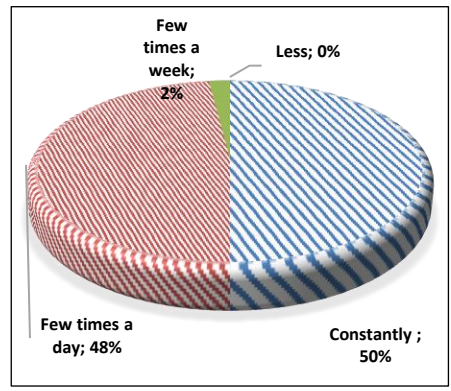

Fig. 2. Frequency of IT use

Technology Use

Social networks (93%), electronic mail (90%) and accessing online video recordings (89%) were notedas the most popular IT technology used (Fig. 3). Apart from web browsing (79%), the other usage was surprisingly low; well below 50%, with accessing e-learning systems at 21%.

The general use of technology was inclined towards communication, both private(at a higher level – 90%) and related to studying (82%) – Fig. 4. It was followed by searching information, both general and related to learning, very close at 68% and 67%, respectively. Surprisingly, the text processing (29%) came nowhere close to the top, even lower than calculations (30%).

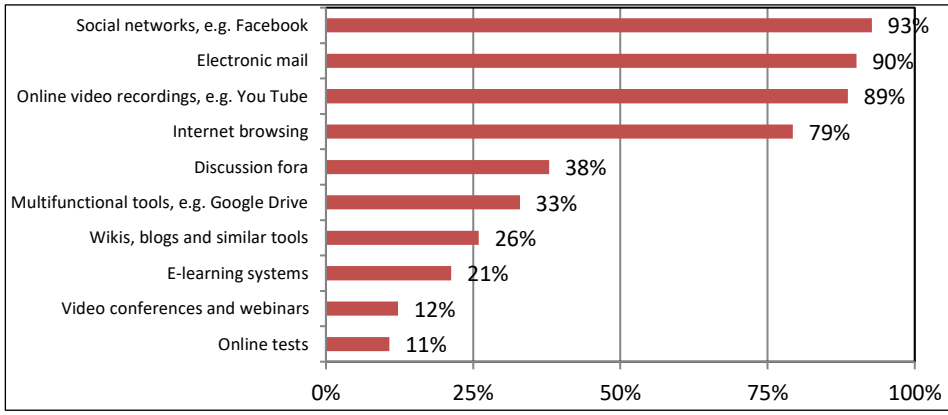

Fig. 3. Most popular IT technologies

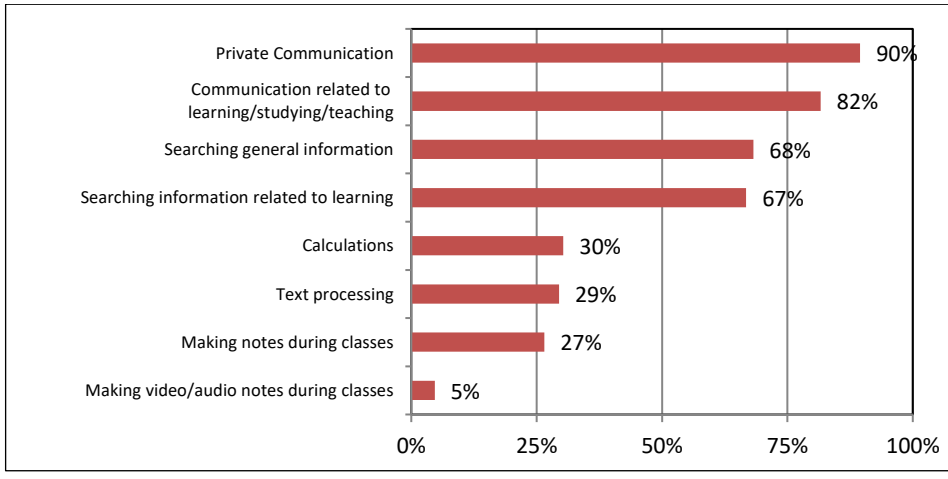

Fig. 4. General use of IT technology

Declared IT Skills

Students declared possessing skills in searching and using internet (92%) and in the use of general software such as word processing (91%), presentation software (80%) and spreadsheets (80%) – Fig. 5. Skills related to data base (38%) and use of different operating systems (36%) were at much lower level. The later may be a bit unexpected since huge number of students stated the use of laptops/notebooks (91%) and desktops (31%) and at the same time the use of smartphones (85%). It is quite unlikely that those devices were based on the same operating systems. The only conclusion which can be drawn, is that students were not aware of the operating systems on the devices, showing rather low level of IT knowledge and interest.

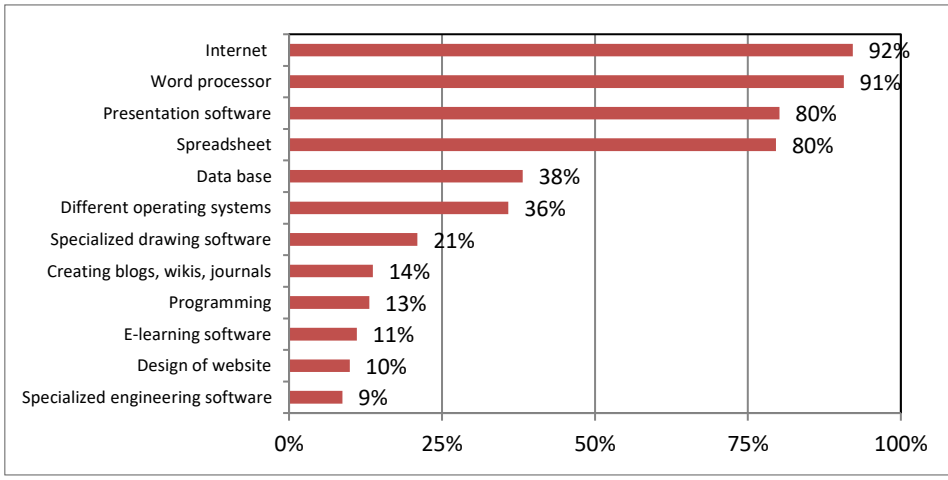

Fig. 5. Declared IT skills by students

Since students were registered for engineering programmes the declared skills in specialized drawing software (21%), programming (13%) and particularly in specialized engineering software (9%) were shocking.

Discussion &Conclusions

The general picture painted by the results of the survey is not a positive one. Although, students are surrounded by common type of technologies such as laptop/notebooks (91%) and smartphones (85%), and use them almost constantly (50%), its use is not directed towards learning process and, especially, towards learning engineering applications. Students use IT, mainly for social networks (93%), electronic mail (90%), accessing online video recordings (89%) and internet browsing (79%). Surprisingly low percentage of students used IT for other purposes, including low use of e-learning systems (21%). The IT was used for communication both for private use (90%) and that related to studying (82%). The use of text processing was astonishingly low at 29%.

The knowledge and skills of specialized engineering software declared by students was surprisinglylow and indeed alarming. The same applies to skills in programming. Those numbers, together with low usage of text processing,may indicate that the application of IT in studies is very low. The students may communicate using IT for studying, they may also use it for learning purposes but that must be restricted to searching and using information for direct studying and not for processing knowledge, preparing submissions for their assessment or making calculations. It appears that students' IT ownership, access, and some, although limited, competencies have not translated into use for educational purposes.

The current study was restricted to students only and the findings require further examination with the participation of the instructors.

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