Adult Learners Information Literacy and Technological Skills within University Education

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ABSTRACT

Higher education is changing to serve the needs of the 21st century called the information age where the building of the knowledge society is the highest priority. Universities are becoming mass; therefore their readiness to train competent citizens goes in line with contemporary challenges caused by new technologies, abundance of information resources that adult learners face in learning process. These issues require investigating the level of students’ competence with a special focus on their technological capacity necessary to cope with a great variety of information search locations, its resources and formats. The paper presents research findings on students’ information literacy, ICT skills and their attitude towards the Internet as an information location.

In pursuit of drawing a comprehensive picture of Lithuanian situation in the field of the researched issue a questionnaire survey was conducted which aimed at evaluating: a) Lithuanian students’ self-perception of information literacy competency; b) experience in dealing with ICT in learning process; c) their attitude towards the Internet as information location and resource; d) students’ skills to use multimedia technology for learning purposes.

The comparative analysis of the situation within nine Lithuanian universities has disclosed insufficient level of information literacy, ICT skills for self-directed studies among the surveyed students. The research findings indicate differences in students’ performance compared by the mode of study evidencing much lower extramural study mode students’ skills which are below the high standards of modern higher education.

1. INTRODUCTION

Scaffolding of learners by using modern technologies and information processing techniques stands as one of the major issues related to the quality of studies in higher education. Students’ self-development implying academic progress and development of personal characteristics is considered to be one of the dimensions of quality in higher education [1]. Contemporary academic learning involves learners in coping with a huge amount of information resources in a variety of formats [2, 3]. ICT provide wider and bigger choices of learning material that very often is not tailored to learning needs. Students, therefore, as processors of information, should be equipped with a certain level of information and technological skills up to high standards and requirements of higher education as outlined in the EU and Lithuanian documents on higher education.

2. OVERVIEW OF LITERATURE AND DOCUMENTS ON CHANGING EDUCATION PARADIGM

European and national documents on education [4, 5, 6, 7, 8, and 9] direct towards development of human capacities and competencies necessary to apply modern ICT.

In EC Communication on modernization of European universities lifelong learning is seen as a challenge for all universities which “will require universities to be more open to providing courses for students at later stages in the life cycle. It presents an opportunity for universities which might otherwise risk to see enrolments of students directly from school fall over coming years in view of coming demographic change” [8, p. 7]. The necessity to develop effective methods of teaching and learning to respond to students as future lifelong learners’ needs emerging in this perspective calls for rethinking education paradigm within university education.

Higher education is changing to serve the needs of the 21st century called the information age where building of the knowledge society is taking place. Today’s adult learning experiences challenges caused by sophisticated technologies and therefore, is forced to search for new and effective methods of teaching and learning.

3. LEARNING ENVIRONMENT

Scholars interested in innovations in teaching and learning claim that learning activities must be presented in an authentic context through social collaboration and interaction. The concept of learning environment has been investigated since the first half of the 20th century. Learning environment is a complex phenomenon that has to be researched in five aspects: physical, psychological, social, intellectual, and administrative. Learning environment is
conditioned by learning goals, teacher’s personality, teaching strategy, methods, technologies, material, resources, and interaction between group members [10]. Students’ perceptions in learning environment are of great importance for researchers involved in investigation of learning [11]. Phenomenographers focusing on learning and learners’ experiences understand learning as “a change in the learner’s capability of experiencing a phenomenon in the world around them”[12, p.9]. They argue that understanding learning environment phenomenon and learning content is crucial for understanding how learning occurs. Web-based learning with word processors, data bases, drawing programs, multimedia presentations provide environment for collaboration. On the other hand interactivity can imply psychological, emotional, behavioural problems. Thus, deep insight into students’ experiences in technology-rich learning environment is of key importance for researchers seeking better understanding of learning per se and its enhancement. From a constructivist perspective cognition is viewed as a collaborative process and modern constructivist learning environment provides for cooperative or problem based learning, student-centered instructional approaches, all of which appeal to the powerful social nature of learning. Web-based activities (participation in projects, surveys, case studies, etc.) usually being long-term activities require students’ lifelong skills, such as IT, information literacy, or presentational skills.

Teachers should consider their new role in online teaching or web-based environment by fostering a sense of community among learners.

4. ICT IN LEARNING

In modern education science three paradigms of ICT integration in learning predominate: 1) technocratic; 2) reformist; 3) holist [13]. These paradigms can be differentiated by their conceptual approach to ICT and learning „convergence“. Technocrats accept ICT as inevitable phenomenon not questioning the results and consequences of it. Reformists view ICT use from revolutionary positions claiming that it supports constructivist, collaborative learning; holists discuss the question from the perspective of social and cultural aspects of understanding, stressing values, on which education and decisions related to education issues should be made.

Collaboration, students’ autonomy, originality, critical approach, imaginative performance are positive characteristics of ICT use in learning [14]. Competencies necessary for effective and creative application of ICT, good command of digital technologies impact positively on learning achievements. Alienation, superficial communication, or depression (less human contact) have been also observed among negative factors of ICT [15]. Information technologies provide with a variety of opportunities and forms of learning; therefore it is a highly important factor, influencing learning from the cultural, social and value perspective [16, 17, 18]. Hennesy et al. [16] highlight significance of ICT as a „cultural artifact“ that is gradually influencing pedagogy in parallel with changes in teachers’ practice, thinking, approach, roles, and methods of technology use. It is worth mentioning that British educationalists’ approach towards ICT is much more sceptical compared to the viewpoint prevailing among American scholars. Selwyn et al. [19] researching adult learners claim that the question of ICT use has to be based on the premise of viewing it from socio-cultural, economic, political perspectives. Virtual tools demand from learners much higher levels of interaction, such as analysis of not pedagogically processed material, problem solving, decision making and evaluation. All the above mentioned skills are indicators of an information literate learner.

The use of ICT in any life-context will not be efficient without mastering information literacy skills. Although the concepts computer literacy and information literacy are different in scope, they are often confused. Computer literacy is understood as abilities necessary to use a personal computer, to create and manipulate documents and data via word processing, spreadsheets, databases and software tools. Variety of information formats and resources have had a great impact on emergence of other forms of literacy: “Other literacy such as digital, network, media, visual, and basic are implicit in information literacy” [20, p.11].

5. INFORMATION LITERACY SKILLS IN EDUCATION

Information literacy defines much more general abilities such as self-directed learning, abilities to utilize a variety of information resources and formats, have deep understanding and knowledge of the information world, and internalize values that motivate ethical and legal use of information. Some authors argue that different ideas of information literacy and often too narrow interpretation of the concept encourages students’ surface approach to learning, for example, understanding information literacy as library instruction. Thus, information literacy being a more general concept, embraces more specific literacies of a particular area. A very wide understanding of information literacy concept which is in isolation from the learning process is also criticized [21, 22, 23, 24, 25, 26]. The significance of the term is associated with complexity of information environment, information products, digital space [23, 27]. Generality of the concept covering computer skills,
description of cognitive and metacognitive abilities in the light of learning to learn philosophy is criticized too [Boyce in 22].
The relevance of information literacy emerges in the context of the shift in teaching and learning paradigm where learning is considered as self-directed, autonomous activity steered towards lifelong learning in programme documents at national (Lithuanian) and international (EU) level. Thus, information literacy becomes a core background in the perspective of lifelong learning.

6. STUDY METHODS AND DESIGN

The aim of the research study presented in the paper was to evaluate present situation related to students’ information literacy and technological competencies at universities of Lithuania. The object of the empirical research was the level of students’ information literacy performance, their attitudes to information search, its processing and use for academic purposes.
The tasks of the study were:
• Quantitative analysis of Lithuanian situation within nine universities exploring students’ self-perception and experience in relation to information literacy;
• Discussion of the research findings based on comparative analysis between the full-time and extramural study mode students.

To address the above mentioned issues of adult learners’ enhancement in technology rich learning environment a questionnaire survey on Lithuanian students’ capacity in the area of information literacy and application of modern technologies was conducted. The instrument composed of 30 variables was designed with reference to Information Literacy Standards for HE [ACRL, CAUL frameworks]. The internal consistency and reliability of the questionnaire was tested by Cronbach alpha (, 6877). In pursuit of drawing a comprehensive picture of the Lithuanian situation in the field of the researched issue the questionnaire aimed at evaluating: a) Lithuanian students’ self-perception of information literacy competency, experience in dealing with ICT in learning process; b) their attitude to different information resources; c) the students’ critical thinking and assessment abilities; d) their skills to apply these abilities in the study process.

Statistical analysis of the research findings was conducted using Statistical Package for the Social Sciences (SPSS) version 12.0 for Windows. Pearson Chi-square criterion (x²) was employed to define the dependence between the investigated variables.

Comparative analysis of the research data presented below was performed between the two modes of study: the research sample of 700 respondents was composed of 361 full-time and 339 extramural students. The distribution by the study mode was even: 51.6% (N= 361) of the sample represented the full-time-study mode students and 48.4% (N =339) – extramural students. The biggest portion of the participants were in the 1st year of their studies - 238 (34.0%) and 292 (41.7%) in the - 2nd year. The research was represented by participants from 20 faculties, 4 institutes and the international business school (Lithuania). More than a half of the study participants (60.9%, N=426) comprised the group aged 18 -23, the second group aged 24 -29 was represented by 16.9% (N=118), the third group aged 30-39 – 16.9% (N=118) and the last group aged 40 and over was represented by the smallest number of the participants – 5.5% (N=38). The majority of the respondents (83.9%, N=587) represented residents living in Lithuanian cities, 8.1% (N=57) lived in settlements and 8.0% (N=56) of the sample lived in villages. According to the gender the research sample was composed of 71% (N=497) female and 29 % (N=203) male students. The distribution of the sample by age, gender is presented in table 1.

Table 1.

<table>
<thead>
<tr>
<th>Age</th>
<th>N</th>
<th>%</th>
<th>Gender</th>
<th>N</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>18-23</td>
<td>430</td>
<td>61.4</td>
<td>female</td>
<td>495</td>
<td>70.7</td>
</tr>
<tr>
<td>24-29</td>
<td>117</td>
<td>16.7</td>
<td>male</td>
<td>205</td>
<td>29.3</td>
</tr>
<tr>
<td>30-39</td>
<td>118</td>
<td>16.9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>total</td>
<td>700</td>
<td>100</td>
<td>total</td>
<td>700</td>
<td>100</td>
</tr>
</tbody>
</table>

The limitations of the research were conditioned by the complexity of its aims. In order to address the aims stated above this paper explores the part of the collected data that is relevant to the questions discussed in this paper. Comparisons have been made between the two modes of study, forasmuch greater differences were expected between the latter than between universities.

7. DISCUSSION OF THE RESULTS

7.1. Students’ experience of ICT and the Internet use

In order to understand the potential university students bring from school and their abilities to demonstrate it, the study examined participants’ experience of ICT use at the secondary school and their attitudes towards the Internet.

Students ICT skills acquired at the secondary education were compared according to the study mode: between full-time and extramural students. Students’ responses about the opportunities to develop their ICT skills at school were significantly different: 62.8%, (N=172) of the full-time respondents stated that they had been taught to deal with ICT, whereas only 26% (N=79) of extramural students had an opportunity to develop ICT skills at school and 50% (N=152) claimed having had no experience to use ICT at all. Comparing survey
findings between the full-time and extramural participants statistically high level of significance was obtained (p<0.001).

Fig. 1 ICT skills acquired at secondary school

Students’ responses concerning ICT use in seminars and classes at university revealed rather scarce ICT application in learning process. 13.4% of the students admit that they always use technologies as a means of learning, however, one fourth of them (25.6%) never use ICT. A bigger number of extramural students indicated that they never apply ICT (F- 21.3%; E-30.1%).

Students were asked to evaluate their skills to use the Internet. The respondents’ answers from both study modes indicate differences in distribution. Although statistically significant result was not obtained (p>0,22), the findings evidence a need of fostering students’ skills in this area. The data imply that more full-time students have better Internet skills: 24,1% (N=66) of them possess excellent, and nearly half of them (48,5%, N=133) - good skills. Slightly over 1/5 of the extramural students indicated having good skills. Almost 1/4 of the full-time and 1/3 of the extramural study mode respondents admitted having satisfactory (F -22,6%, E - 25,7% ) or poor skills (F - 3,6%, E - 7,6% ) (see Fig. 2.).

Fig.2. Skills to use the Internet

However, the majority of the respondents suggested that ICT use assisted in learning their professional subject (79.8% N=461). The next question, which has an immediate relation with the previous one, interviewed students on the purposes of the Internet use: a) learning; b) emailing; c) general information search; d) reading newspapers; e) computer games. The biggest number of the survey participants utilize the Internet for learning purposes: full-time - 87.2% (N=239), extramural - 83.9% (N=257). Students from both study modes use the Internet for 1) emailing: F - 75.5% (N=269) and E - 67.8% (N=206); 2) searching general information F - 72.6% (N=199) and E - 69.1% (N=234). Other purposes were indicated by fewer research participants. Statistically significant relation was obtained between the use and non-use of the Internet for the indicated purposes (p<0,03). The three major purposes of the Internet use are presented in Fig. 3.

Fig.3. Purposes of the Internet use

Although the majority of the research sample use the Internet for learning purposes their skills to apply the Internet in learning practise call for development. These findings imply educational shortcomings of academic environment (technological equipment, teachers’ unwillingness to apply technologies, etc.) that are vital for students’ successful performance and better learning outcomes.

7.2. Multimedia technology skills

The respondents were asked to evaluate their skills to use multimedia technologies for learning needs. 44,3% (N=310) of the respondents gave positive answers concerning their skills to apply multimedia for learning purposes. However, one third of them claim to have weak skills and 23,9% (N=167) of the sample do not possess these skills. Statistically significant difference (p<0,007) was obtained. Comparison between the study mode proved extramural students’ lower capacity of using multimedia technologies (p< 0,001) (see Table 2).

Table 2. Students’ skills to use multimedia technology

<table>
<thead>
<tr>
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<th>Study mode</th>
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<tbody>
<tr>
<td></td>
<td>Full-time</td>
</tr>
<tr>
<td>Responses</td>
<td></td>
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<tr>
<td>Yes</td>
<td>190</td>
</tr>
<tr>
<td>Weak</td>
<td>110</td>
</tr>
<tr>
<td>No</td>
<td>61</td>
</tr>
<tr>
<td>Total</td>
<td>361</td>
</tr>
</tbody>
</table>
The next question aimed at examining students’ skills to use multimedia for various learning activities (making a presentation; written assignment, carrying out research, project activity). The responses were presented in a rank scale (weak, satisfactory, good, do not use). A considerable bigger number of extramural students admitted to have no multimedia skills to make a presentation – E - 42,4%, F- 17,2% (p < 0,001); to write a (course) paper - E - 43,4%, F-23,0%, (p<0,0001); to carry out research - E-55,8%, F - 28,0% (p<0,0001); to participate in a project activity – E- 51,6%, F- 23,5% (p< 0,0001). Thus, extramural study mode students possessed much weaker skills.

7.3. Information literacy skills
The participants of the survey assessed their information literacy skills in 5-point scale (1-poor, 2-satisfactory, 3-average, 4-good, 5-very good, did not specify). Referring to the specified responses we claim that statistically significant difference was observed between the study modes. Analysis of university students’ self-perception of information literacy competency revealed the following:

- Distribution of the results on university students skills to analyse material that is not processed for learning purposes: 36,1% (N=99) of full-time and 30,9% (N=94) of extramural students claim to have average skills, and respectively 32,1% (N=88) full-time, and 28,9% (N=88) extramural respondents are able to perform this task well. However, 8,8% (N=24) of the full-time and 13,8% (N=42) of extramural students do not rank their skills in this area, as most likely they do not possess them. Thus, statistically significant difference was obtained between the data on full-time and extramural students responses, who did not specify the level of their skills (p<0, 04).
- Full-time students are also more able to summarize a text (p<0, 03).
- Ability to critically evaluate collected material is better developed by a greater number of full-time students compared to the extramural study mode respondents. 8,8% of full-time and 14,8% extramural respondents did not specify the level of their ability. Statistically significant difference was observed between possession of critical evaluation skill and absence of this highly important academic skill between the two study modes (p<0, 02).
- Full-time students also succeed better in selecting necessary information for accomplishment of the assignment. This is specified by received statistical significance (p<0, 03).
- Full-time students’ results on processing selected information, presenting personal opinion and conclusions are also better compared to the data collected from extramural students’ responses.

However, statistical significance concerning this variable was not observed.

Students responses showed that half or even more than a half of the study sample do not possess skills: to define the most relevant source of information, to critically evaluate collected information, to process it for a given assignment and deliver it in an appropriate way, presenting critical evaluation of the obtained material. Such skills are crucial in information abundance settings where students are required to deal with pedagogically unprocessed material and transform it into a learning product.

8. CONCLUSION

The research findings revealed underdeveloped information literacy skills among university students that are insufficient for effective and self-directed learning at university. Most of the respondents acknowledge importance of these skills; yet not so many of the surveyed students can use them confidently in practice. The majority of the sample (80,0%) expressed positive attitude towards ICT emphasizing the positive impact of technologies on knowledge of a study subject. But uneven school experience in ICT use (extramural students claim to have had little experience) strongly affects their learning progress and efficacy. These results also emphasize the need of enhancing students’ information literacy skills seeking more productive and creative use of ICT in learning. Students’ responses show that half or even more than half of the study sample do not possess the following skills: to define the most relevant source of information, critically evaluate collected information, process it for a given assignment and deliver it in an appropriate way, presenting critical evaluation of the obtained material. Such skills are crucial in information abundance settings where students are required to deal with pedagogically unprocessed material and transform it into a learning product.

The lack of skills to deal with the Internet and virtual resources, abilities to critically evaluate needed information, to prioritize information resources, select the best ones, express critical point of view can hinder efficiency in learning and have a negative impact on learning outcomes. The results proved the need to foster students’ skills to use the Internet as the majority of them see the Internet as the most reliable information location; comparatively a small part of the sample gives their priority to their university library. The situation analysis within nine Lithuanian universities disclosed insufficient level of information literacy skills for self-directed studies among the surveyed students. The research findings indicated differences in students’ skills and performance compared by the mode of study:
The extramural students’ school experience in ICT use is inconsiderable (determined by objective circumstances – age, rapid development of ICT) in comparison to full-time students. This can cause serious obstructions in studying at university. Therefore, these aspects should be considered before delivering teaching to different study mode students.

- The findings indicate that extramural students possess lower multimedia technology skills and are not able to use them for learning purposes.
- They also demonstrate weaker analytical, critical thinking, evaluation skills.

These findings necessitate reconsidering teaching and delivery methods for extramural study mode students.

References


