

STUDY MATERIALS FOR UNIVERSITY STUDY AND FURTHER EDUCATION: COMPARATIVE ANALYSIS OF LEARNING PREFERENCES IN 2010 AND 2014

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Abstract

Learners' preferences in various types of study materials differ reflecting the criteria of learning objectives, forms of education, learner's age and level of knowledge, time and others. The paper presents results of a survey dealing with comparative analysis of learners' preferences from three criteria: (a) ways of getting study materials, (b) types of preferred formats of study materials (full-texts, short texts structured for the distance education, presentations, animations, links to sources, others), and (c) using different mobile devices to access the materials. The data were collected in 2010/11 and 2013/14 academic years from 300 students.

Introduction

Individual learning preferences play an important role in the process of instruction, especially if a Learning Management System (LMS) manages it (Šimonová, 2008). A rather wide range of tools is available to designers of e-learning courses, which can accommodate all learning styles and students choose those activities that suit them best. For example, according to Johnston (1996), technical processors prefer graphical presentations of the learning content and practical activities, confluent processors individually create new designs, precise processors emphasize clear questions and answers to them, and sequential processors solve problems step-by-step.

Despite numerous advantages that were detected in the use of interactive multimedia tools, there exist several conflicting ideas concerning practical application of learning styles (Mareš, 1998). The effectiveness of the educational process is determined by many factors, e.g., learner's intelligence, level of knowledge, motivation, self-confidence, and learner's cognitive and learning style. Teacher's teaching style and the matches/mismatches with students' learning styles affects the efficiency of the educational process to a large extent. Some authors (for example, Felder and Silverman, 1998) say that mismatching can cause further educational problems. It favors certain students and discriminates against others, especially if the mismatches are extreme. On the other hand, if the same teaching style is used repeatedly, students become bored (Gregorc, 1979).

The process of instruction supported by ICT may become suitable and beneficial for learners of various styles. The reason is it offers a wide range of tools and activities that can be tailored to any learning style and used by any instructor's teaching style. The possibility to individualize the educational

process from the both students' and teachers' point of view (e.g., time, place, pace) is among the valuable advantages of e-learning (Šimonová, Poulová, & Šabatová, 2009).

New possibilities offered by modern technologies produce new questions. Educators face the question of whether the educational process supported or managed by ICT and tailored to the student's preferred learning style results in more and/or deeper knowledge that students have after the instruction compared to the situation if the learning style is not taken into account.

The Questionnaire Monitoring Preferred Formats of Study Materials

Since 2001, when the process of ICT implementation started at the Faculty of Informatics and Management, University of Hradec Kralove (FIM UHK), students' feedback was collected. In 2010 a project started aiming at detecting whether students' choice of a certain type of study materials is influenced by the pattern of learning preferences detected by the Learning Combination Inventory by C. A. Johnston (1996), which classifies four types of processors: precise, sequential, technical and confluent ones.

Research 2010

A simple questionnaire consisting of nine questions was prepared for this purpose in which students defined their relation to following types of study materials:

- Books and professional literature
- Electronic study texts
- PowerPoint presentations
- Video-recorded lectures
- Animations
- Self-tests
- Hands-on tasks and examples
- Other supportive materials, e.g., dictionary

Students were asked to define what type of study materials they prefer when preparing for lessons during the term and studying for exams. Single items were in the form of statements and evaluated by a five-degree scale (1 – never, 2 – hardly any time, 3 – sometimes, 4 – almost always, 5 – always).

Examples of all types of study materials were provided so that no misunderstandings could appear. The questionnaire was distributed during the summer term in the 2009/10 academic year to 107 students of the Faculty of Informatics and Management, University of Hradec Králové in study programmes Applied Informatics and Information management, who also filled in the Learning Combination Inventory (LCI). The LCI is a questionnaire detecting students' individual learning preferences. It was designed by C. A. Johnston and consists of 28 multiple-choice questions and three open-ended ones (Johnston, 1996). So consequently mutual relations can be researched among single patterns and preferred types of study materials.

The received results partially proved our expectations.

Students, mainly those in technical specializations, seldom worked with printed sources. In 2010 only 1% of students almost always bought the recommended books, one third (33 %) did this sometimes, and two thirds (66 %) did not buy books at all. This fact could be influenced by the price. Nevertheless, similar results appeared in a question dealing with borrowing printed sources available in university library. Only 7% of students borrow books regularly, half of them (48 %) do this sometimes and 45 % never or hardly any times borrow the recommended books (see Figure 1).

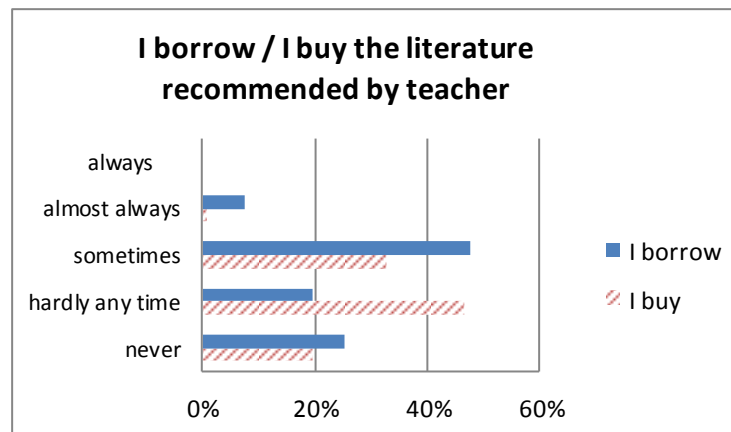


Figure 1. The use of printed books.

These results show the students prefer to work with electronic materials if the teacher provides them in the Learning Management System (LMS), which is not surprising because students participating in the research were on the Informatics study programme.

Nearly all students (93 %) always and almost always use presentations of the topics, 5 % use them sometimes, and only 2 % of students never use the presentations. The vast majority of students (87 %) always and almost always work with electronic study texts, 10 % use them sometimes, 2 % hardly any time, and only 1 % never use electronic study texts. A reason might be that the respondents studied IT study programmes, so the close relation to e-types of study materials was not surprising. Other types of study materials (e.g., dictionary) are used to a considerably less extent: 42 % of students always and almost always use them, another 41 % use them sometimes, and 17 % of students say they never and hardly any time work with other types of study materials (see Figure 2).

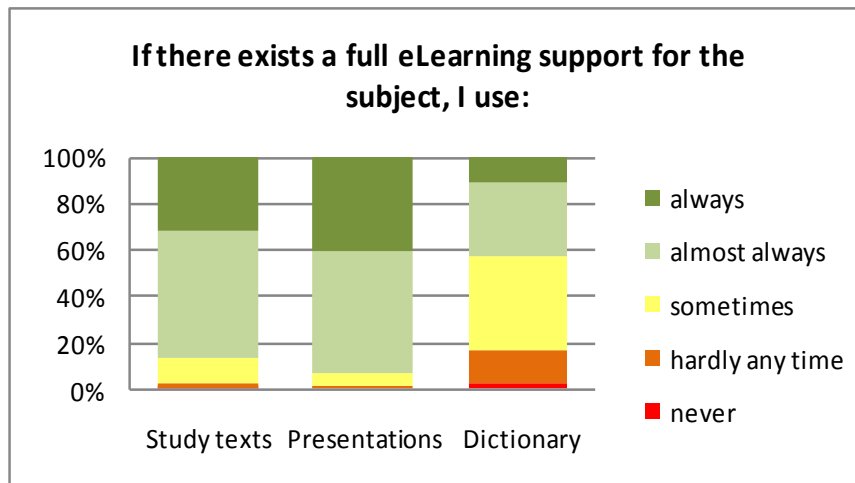


Figure 2. The use of electronic study texts, presentations and other supportive materials.

In some e-learning courses animations, video-recorded lectures or case studies are available to make some difficult parts of learning content more clear and easier to understand. These materials are used less than presentations or study texts. Animations are more frequently used; more than half of students always and almost always use them (53 %) if they are available, one third of students (34 %) sometimes, and only 13 % never and hardly any time work with them. Video-recordings, which are more demanding to be prepared and can be found only in selected e-learning courses, are less popular among students. More than one third of students (38 %) never and hardly any time use them, one third (33 %) sometimes, and even fewer students (29 %) always and almost always work with them if they are available (see Figure 3).

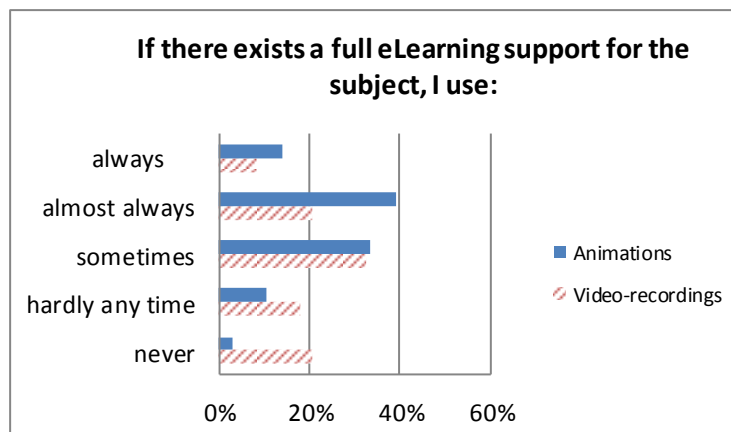


Figure 3. The use of animations and video-recorded lectures.

Designers of e-learning courses include various feedback-providing tools, such as self-tests and numerous hands-on examples or tasks. Although these are to help students understand the problem, they are used less frequently than study texts and presentations. More than two thirds of students (68 %) always and almost always use the provided examples, 28 % sometimes use them, and 4 % never work with them. Self-tests are even less used. More than one fourth

never and hardly any time uses them, 39 % sometimes, and only less than one third (31 %) always and almost always work with them (see Figure 4).

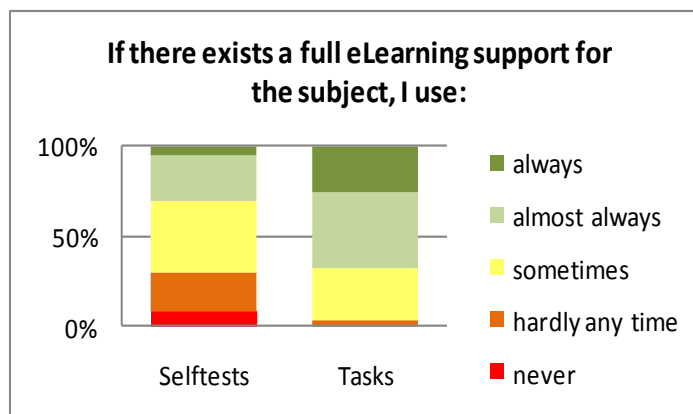


Figure 4. The use of self-tests and hands-on tasks.

Research 2014

Four years later another survey was held at the University of Hradec Kralove, Faculty of Informatics and Management. A total of 203 FIM students (male 60 %; female 40 %) participated in the research who matriculated in 2013/14 academic year in bachelor study programmes of Applied Informatics (AI3), Financial Management (FM), Tourism Management (MCR), Information Management (IM3), follow-up two-year master study programmes in Applied Informatics (AI2) and Information Management (IM2) and doctoral study programme in Knowledge Management (KM) and Applied Informatics (AI). The questionnaire consisted of 22 items; the question on sources that students exploit within their higher education was considered from two points of view: (a) students’ gender (male/female opinions) (see Table 1 and Figure 5) and (b) study programmes (see Table 2 and Figure 6).

QU (a): Which sources of information do you use for your university study? (You can tick all choices)

Table 1

Sources of Information from the Gender View

	All	Male	Female
Personal attendance of lectures	85%	83%	87%
I buy textbooks	30%	22%	41%
I borrow textbooks from libraries	53%	38%	76%
E-subjects in LMS	91%	89%	94%
Study materials on university web page	72%	76%	66%
Wikipedia	42%	50%	29%
Materials available from the Internet (for free)	77%	83%	67%
Facebook	57%	57%	57%
Discussion groups	72%	78%	63%
LinkedIn	1%	1%	1%
Google+	11%	6%	18%
Other sources	8%	10%	6%

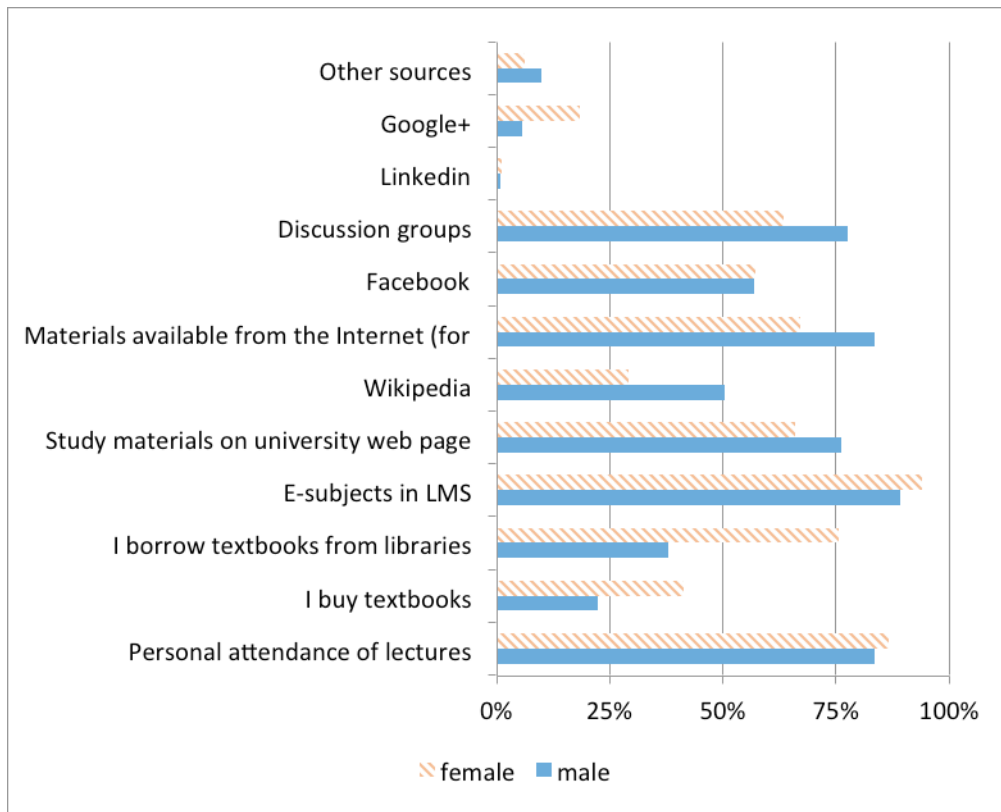


Figure 5. Sources of information from the gender view.

The results show female students much more frequently buy books or borrow them from libraries, but the frequency of personal attendance of lectures and working in online courses in LMS are similar; the visit rate to Social network Google+ is more frequent with the male students. On the other hand, males prefer having study materials directly from university web page, where material were accessible from in the past, from the Internet in general, from Wikipedia, and, what was rather surprising, they are more active in discussion groups within LMS.

QU (b): Which sources of information do you use for your university study?

Table 2

Sources of Information from the Study Programme View

	All	AI	IM	Management
Personal attendance of lectures	85%	85%	75%	91%
I buy textbooks	30%	24%	39%	32%
I borrow textbooks from libraries	53%	37%	36%	81%
E-subjects in LMS	91%	92%	95%	88%
Study materials on university web page	72%	80%	77%	60%
Wikipedia	42%	60%	34%	27%
Materials available from the Internet (for free)	77%	86%	66%	73%
Facebook	57%	63%	48%	56%

Table 2. Sources of Information from the Study Programme View (Continued)

	All	AI	IM	Management
Discussion groups	72%	80%	82%	57%
LinkedIn	1%	0%	2%	1%
Google+	11%	5%	9%	19%
Other sources	8%	11%	11%	4%

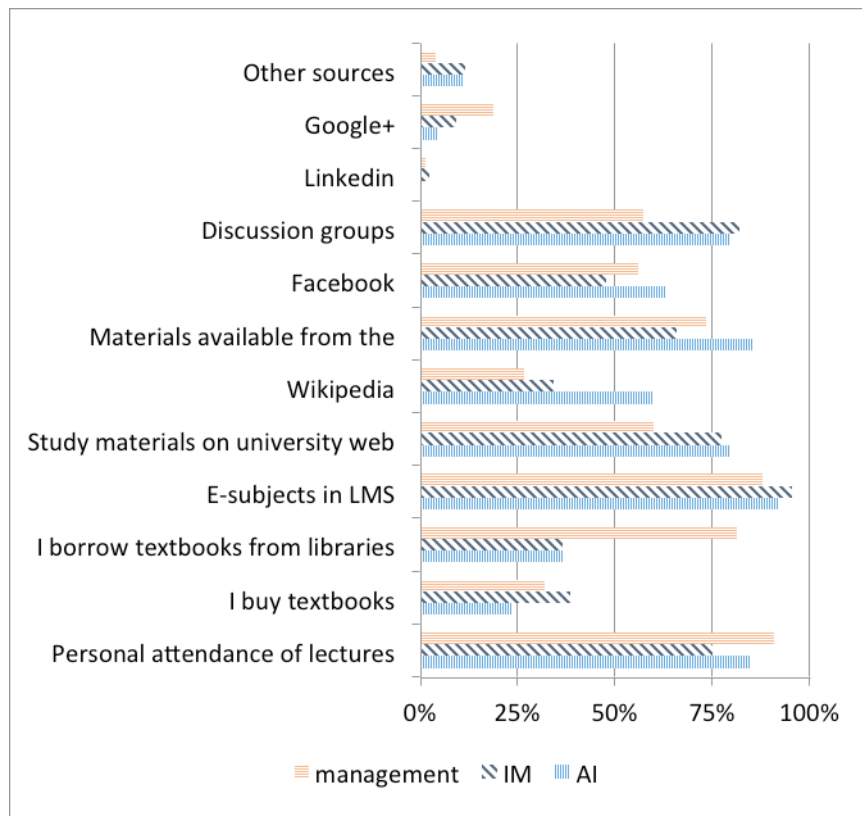


Figure 5. Sources of information form the study programme view.

From the point of view of various study programmes, the management students definitely prefer borrowing books from libraries, as well as attending lectures; they participate neither in social networking activities, nor use Wikipedia very often. As expected, students in both IT programmes strongly prefer using study materials from e-subjects in the LMS, university web page and the Internet in general. More than half of them visit various social networks. These are strong characteristics that deserve to be definitely used for education purposes.

Conclusions

University education, which has been changing under the influence of latest information technology development in the Czech Republic, can be researched from various, different points of view. The comparison of data collected in both surveys showed that a rather large amount of students appreciate the choice of having their study materials in electronic form. The most frequent reasons for their satisfaction with the electronic study materials were:

- They have an anything/anytime/anywhere access.
- They can check and re-check the information already mentioned in face-to-face classes.
- They appreciate not spending time in libraries and shops if electronic sources are available.

Although approximately one third of students still use paper-printed materials (either bought, or borrowed), many more prefer various electronic sources, with the multimedia components if available.

Acknowledgement

This paper is supported by the SPEV project N. 2108.

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