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LEARNER PREFERENCES AND REJECTIONS OF SELECTED TEST FORMATS

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Abstract

The article presents the results of the survey on student preferences and rejections of selected types of tests (test formats) reflecting their learning preferences. The survey was conducted at the Faculty of Informatics and Management, University of Hradec Kralove, Czech Republic in the sample of 203 students of Applied Informatics, Information Management, Financial Management and Tourism&Management study programmes. Data were collected by two questionnaires: (1) Learning Combination Inventory by Johnston, which was exploited to detect learner preferences, and (2) Preference/Rejection of selected types of tests, which enabled learners to express their opinions on seven selected types of tests on 10-level Likert scale. The results clearly showed strong preference of questions and tasks pre-defined before the credit test or exam, both in the oral and written forms. This finding might lead to a conclusion that student flexibility and creative thinking are not sufficiently developed for autonomous work and searching for new solutions, as required by numerous educational documents.

Keywords

assessment, evaluation, testing, types of test, test format, LMS, ICT, adaptive e-learning

Introduction

Assessment and evaluation are essential elements of the teaching/learning process. Without an effective evaluation it is impossible to know whether students learned what they had been expected, whether/how much the teaching/learning process was efficient, what should be improved. The processes of assessment and evaluation are closely connected to learners' performance, particularly monitoring and collecting learners' feedback on their knowledge. At the Faculty of Informatics and Management (FIM), University of Hradec Kralove (UHK), Czech Republic, the assessment/evaluation process was considered from the view of students learning preferences. For this process the C. A. Johnston´s approach was applied (Johnston, 1996). Within the assessment/evaluation process, the main question is what is assessed, what is

evaluated and what is tested within the process of instruction. In other words, what do we mean by assessment, evaluation and testing? (Assessing and evaluating student learning. p. 263).

Theoretical background

All three approaches are explored to measure to what exptent the acquired learning content has been mastered by the students, how well the students met the learning objectives. However, scholars and researchers make distinctions between assessment, evaluation, and testing. These are three different terms for referring to the output of the process of teaching/learning to show how much learners know about a given topic – from different points of view:

- Assessment is the process of gathering information on student learning.
- Evaluation is the process of making judgments based on criteria and evidence (ibid, p. 263).
- Testing student knowledge is a special part of the assessment/evaluation process which examines learner knowledge and determines what s/he has learned and knows. The test measures the level of knowledge (and skills) that has been reached.

If analysed in detail, the assessment means the process of documenting knowledge, skills, attitudes and beliefs, usually in measurable terms. The target of assessment is to make improvements, as opposed to simply being judged. In an educational context, assessment is the process of describing, collecting, recording, scoring, and interpreting information about learning (Differences between Testing, Assessment, and Evaluation, p. 2).

Assessment must be an integral and ongoing part of the learning process itself, not limited to final products (ibid, 42 Assessment procedures gather information on all areas of learning Assessment practices should promote equity by giving each student optimal opportunity to learn and to demonstrate what s/he knows (ibid, p. 47). This approach correlates to the Johnston´s question: How would you show your teacher what you have learned? (Johnston, 1996).

Teacher-developed assessment and evaluation have a wide variety how they can be explored, particularly to provide feedback towards improving students learning, to determine whether students have achieved the required level of knowledge (including skills), to set future learning objectives, and last but not least to provide feedback to teachers on the efficiency of their teaching (Differences between Testing, Assessment, and Evaluation, p. 51). To discover how well students are learning, what assessment strategies should be designed to systematically collect information on reaching the learning objectives and achieving learning outcomes are the main criteria to be considered. A broad range of strategies should be used to give students *multiple* opportunities to perform their knowledge, both in the oral and/or written forms, in individual and/or group formats etc. On the other side, evaluation involves teachers in analyzing and reflecting upon information on student learning collected from various sources, particularly through developing clear evaluation criteria (including defining grades for the detected knowledge), considering information from various, reliable and valid sources and applying high-level professional approach (Assessing and evaluating student learning, pp. 263-264).

Within the assessment/evaluation process at FIM UHK student learning preferences were detected by the Learning Combination Inventory (LCI) designed by C. A. Johnston which is

based on her concept of ´Unlocking the will to learn´ (Johnston, 1996). Johnston emphasizes that the traditional learning process arises from the belief that all learning occurs as part of learner´s intelligence – the greater the intelligence, the more a child can learn. Johnston attracts attention to the verb ´can,´ as no one says ´will´ learn (ibid, p. 16). To describe the whole process of learning, she uses the metaphor of a combination lock saying that cognition (processing), conation (performing) and affectation (developing) work as interlocking tumblers; if aligned, they unlock an individual´s understanding of his/her learning combination. The will lies in the centre of the model, and interaction is the key. Thus Johnston compares human learning behaviour to a patterned fabric, where the cognition, conation and affectation are the threads of various colours and quality. It depends on individual weaver (learner) how s/he combines them and what the final pattern is. The LCI differs from other widely used inventories (e.g. by Kolb, Honey and Mumford etc.), as it emphasizes not the product of learning, but the process of learning; it focuses on how to unlock and what unlocks the learner motivation and ability to learn, i.e. on the way how to achieve student optimum intellectual development. This was the main reason why LCI, not any other traditional tool was applied for detecting individual learning styles. The responses to LCI describe the schema (pattern) that drives the will to learn. Respondents are categorized into four groups where sequential, precise, technical and confluent ways of processing information are combined:

- the sequential processors are defined as the seekers of clear directions, practiced planners, thoroughly neat workers;
- the precise processors are identified as the information specialists, info-details researches, answer specialists and report writers;
- the technical processors are specified as the hands-on builders, independent private thinkers and reality seekers;
    - the confluent processors are described as those who march to a different drum beat, creative imaginers and unique presenters.

Assessment/evaluation/testing processes at FIM UHK

The FIM UHK has had a more than two-decade long tradition in the implementation of learning management systems (LMS) into the higher education (in 1999 Learning Space, since 2000 WebCT, which few years later merged with Blackboard). Since 2012/13 virtual desktops have been available to students and teachers, mainly for work with software not providing free/open access (e.g. MS SQL Server, Enterprise Architect) and in 2013/14 the Blackboard Mobile LearnTM version 4.0 for Apple and Android devices was piloted and has been exploited since (this version supports iOS6+, i.e. iPhone 3GS, iPad 2+, IPad mini, iPod Touch 4+ and Android OS 2.3+).

Therefore, the blended learning concept assessment/evaluation/testing is used at FIM UHK to monitor student knowledge in all subjects. Reflecting the results of world-recognized researchers (e.g. Coffield, 2004; Leither, 2011; Felder, 2010; Gregorc, 2004), not only student

learning preferences should be considered but they also included the preference in special assessment formats. In other words, some types (formats) of tests and exams are more preferred, from various reasons. Weak/non-hardly working students often think multiple choice tests are easier because they can select one of the provided answers (this conclusion is valid for multiple-choice tests with one, not more correct answers), as well as speaking or writing on the topic they are interested in, etc.

Having analysed 48 syllabi of selected subjects in IT, Management and Humanities, it was discovered that some assessment formats were applied more frequently than others. The analysis showed that

- multiple-choice written tests are the most frequently used format for credit tests (both as applied during the semester or at the end),
- oral exam format is mostly used for final consideration of student knowledge,
- designing and presenting the project is mostly used in IT subjects.

Survey on monitoring student preferences/rejections of selected testing formats

Considering the results of analysis, student feedback on the most frequently applied types of tests and exams was collected so as to discover whether they are preferred or rejected by students of various learning preference patterns.

Methodology and tools

The process of monitoring student preferences/rejections was structured into two phases:

- First, the Learning Combination Inventory (LCI) was applied to defined student learning preferences.
- Second, student preferences/rejections of frequently exploited types of tests were monitored.

The LCI consists of 28 statements, responses to which are defined on the five-level Likert scale, and three open-answer questions:

- What makes learning frustrating for you?
- How would you like to show the teacher what you know?
- How would you teach students to learn?

Student preferences/rejections of frequently exploited types of tests were monitored by another questionnaire which focused on following types of tests:

- Student is asked a question from the pre-defined list (O1).

- Student is asked a question from the unknown list (O2).
- A question (problem, topic) from pre-defined list is set for essay writing (W1).
- A question (problem, topic) from unknown list is set for essay writing (W2).
- Multiple-choice test with 1 correct answer (W3). As within this type of test other types of tasks were also included for more detailed detection: Multiple-choice task with 2+ correct answers (W4); Yes/No task (W5) and True/False task (W6).
- Students introduce results of the project they worked on during the semester; topic was set at the beginning of the semester (W7).

Student preference/rejection of each type was expressed on 10-level Likert scale (from strongly preferred: 1 to strongly rejected: 10). Data collected under levels 1–5 were considered the preference, data under 6-10 were considered the rejection of the particular type of test. Both questionnaires were available online in LMS Blackboard for three weeks and all students were addressed to fulfil them. Despite the process was anonymous, multiple submissions by one student was not allowed by the system.

Research sample

Totally 203 respondents of FIM UHK bachelor and master study programmes participated in the survey and administered both questionnaires. Other characteristics of the sample are as follows:

- gender: male – 121; female – 82;
- study programme: Applied Informatics – 84; Information Management – 44; Financial Management – 21; Tourism&Management – 54;
- age: below 20 – 4; 20–24 years old – 143; 25–29 years old – 27; 30–39 years old – 22; 40+ – 7 respondents.

Results of survey

Reflecting the survey structure, the collected data were considered from two views: (1) student preferences/rejections within the complete sample; (2) student preferences/rejections from the strongest type of learning preference according to LCI.

Ad 1) Student preferences/rejections in the complete sample

Results under this criterion are displayed in figure 1. Data show that the most preferred types of tests were O1 (Student is asked a question from the pre-defined list; 41 %) and W3 (Multiple-choice test with 1 correct answer; 35 %). As for other types of tasks widely used within W3, W5 (Yes/No task) were preferred by 9 % of respondents, whereas W4 (Multiple-choice task with 2+ correct answers) were rejected by the same amount. Moreover, O2 (Student is asked a question from the unknown list) and W2 (A question, problem, topic from unknown list is set for essay writing) were also rejected by 19 % each and W1 (A question, problem, topic from

pre-defined list is set for essay writing) was preferred by 16 % of respondents. Considering these results we can conclude that students prefer to answer questions and solve problems *known (listed) to them before* the exam, which they can prepare for – or even worse – to memorize their solution. This result does not show they are able to be independent and creative in thinking and problem solving, as required by crucial educational documents, e.g. the concepts of key competences development and framework educational plans (in the Czech Republic). Moreover, the preference of multiple-choice type of test (W3) and Yes/No tasks (W5) proves our experience and respondent opinion mentioned above that the weak/non-hardly working students expect the multiple-choice tests with 1 correct or Yes/no answer to be easier for them as they can ´only´ select one of the proposed answers or solutions.

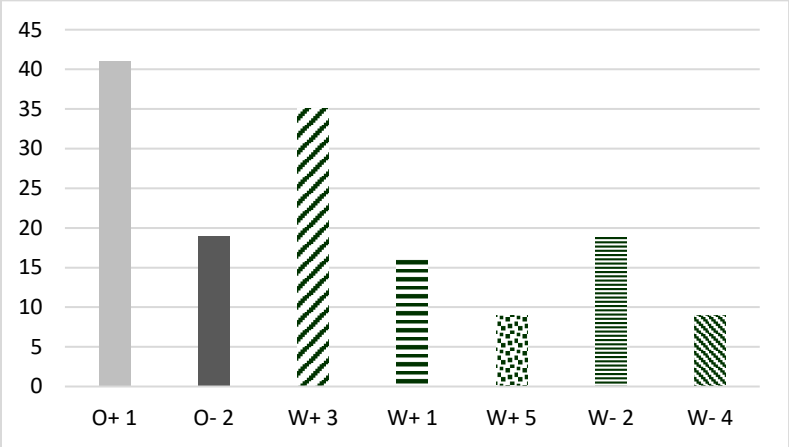

Fig. 1: Preferences/rejections of selected types of tests (%)

More detailed results were discovered if data were considered under the criterion of learning preferences.

Ad 2) Student preferences/rejections from the view of strongest type of learning preference according to LCI

Learning preferences in the sample are displayed in figure 2. As clearly visible, the ´accept´ fields in all four processors are prevailing. This results means that students are able to learn through various teaching methods, using various types of study materials etc. In the group of sequential processors 22 % of respondents have learning preferences of some type, as well as 14 % of technical processors. On the other hand, rejections were detected with 9 % of confluent processors; however, hardly any rejections were detected with other groups.

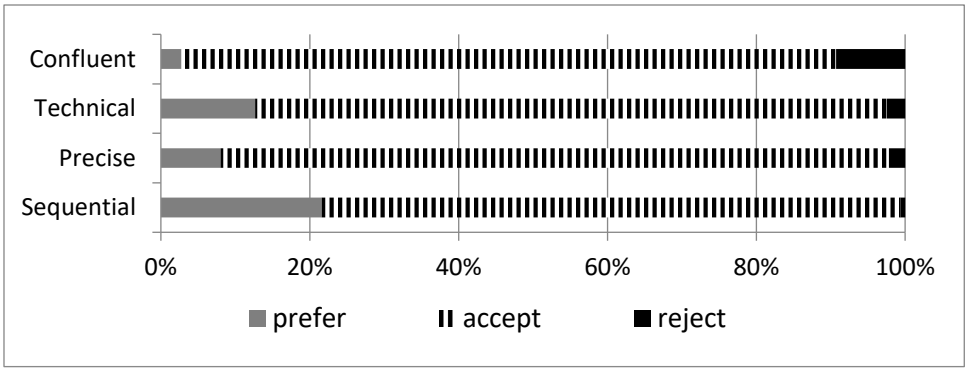

Fig. 2: Learning preferences in the sample group (%)

Without regard to single types of processors, as displayed in figure 3, preferences and rejections were nearly identical with all four groups; they differed in the strengths of preferences or rejections of the presented types. In all groups

- the preferred test types were O1 (Student is asked a question from the pre-defined list) and W3 (Multiple-choice task with 1 correct answer), including Multiple-choice task with 2+ correct answers (W4); Yes/No task (W5) and True/False task (W6);
- the rejected test types were O2 (Student is asked a question from the unknown list) and W2 (A question, problem, topic from unknown list is set for essay writing);
- and, W7 type of test (Students introduce results of the project they worked on during the semester; topic was set at the beginning of the semester) was listed as preferred by confluent processors.

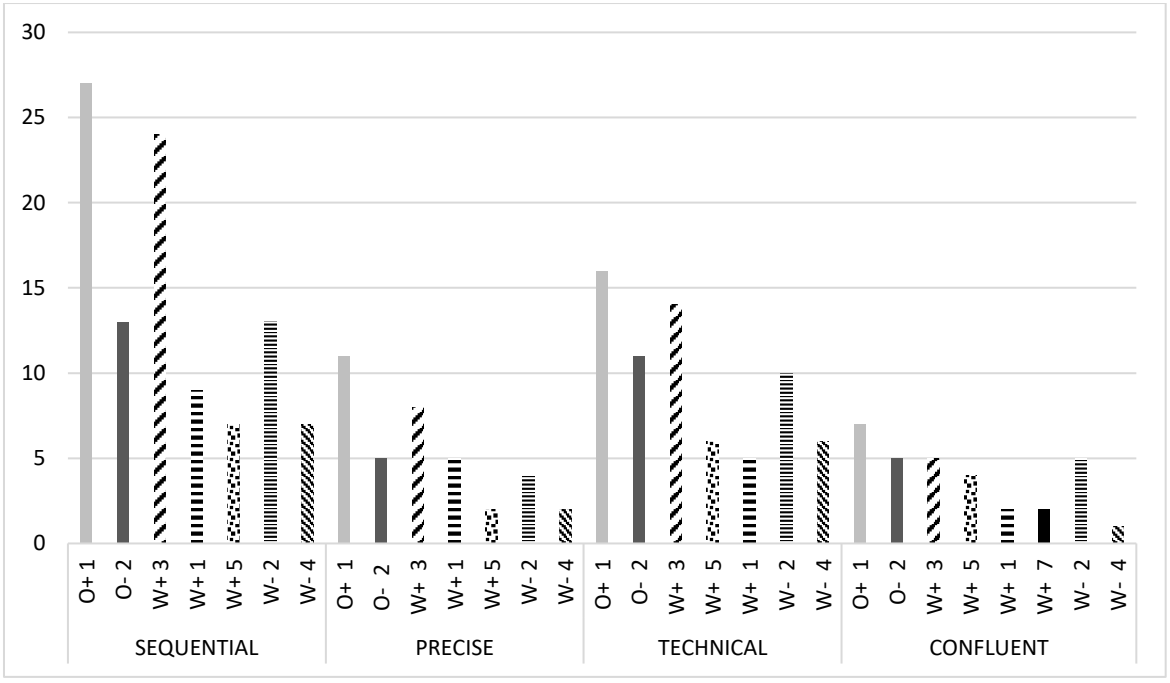

Fig. 3: Preferences/rejections of selected types of tests reflecting learning preferences (Plus (+): preferred type of test, Minus (-): rejected type of test) (%)

Discussions and conclusions

It is not easy to find other publications focusing on assessment, evaluation and testing from the view of student learning preferences because these areas are usually researched separately. Despite this fact, similar results as in our survey were presented by Montequin, Fernandez, Balsera and Nieto (2013). They dealt with technical and human aspects reflected in group dynamics, it means they studied how different combinations of student profiles could explain different group dynamics and at the same time predict the final success of the group. They produced conclusions similar to those of technical processor group in our survey. Contrary to this result, Markovic et al. (2013) focused on adaptive distance learning and testing system and discovered that personalized profiles adapted the learning and assessment process to learner preferences through designing and using adaptive testing systems as part of the curriculum. If multimedia materials were used, the visual/verbal preferences were activated and final knowledge performance was tested by adaptive tools reflecting individual preferences (Chen, Sun, 2012).

Compared to this work, Al-Hudhud (2012) expressed complaints about the lack of adaptive interaction tools in the current LMSs; consequently (in his opinion) the LMSs were not able to reflect learner preferences, neither in learning, nor within the assessment process. In the study he produced design requirements to be implemented so that the LMSs were able to accommodate learner´s preferences.

In the Czech education environment the theory of adaptive e-learning is being developed at the university of Hradec Kralove, Faculty of Informatics and management (Simonova, Poulova et al.) and University of Ostrava, Faculty of Education (Kostolanyova, Kapounova, Sarmanova et al.). However, the process of assessment/evaluation/testing within adaptive e-learning has not been sufficiently worked out.

Reflecting the fact that current process of instruction is widely supported by modern information and communication technologies, we strongly recommend the problem of approaches to assessment/evaluation/testing to be taken into consideration not only in the traditional way of teaching/learning but also in the ICT-enhanced or mobile-assisted instruction. Widely used multiple-choice tests in electronic version are the first step within this process which should be definitely followed by considering their appropriateness to learners with different learning and testing preferences. Whether these will be detected by the LCI (as in our research), or by another tool is the subject of individual researcher decision and the research design reflection.

Considering the Leither´s results (Leither, 2011) in the future we are going to continue this research focusing on verification of correlations between single types of processors and types of tests, as presented in this work, by comparing the test scores collected from various formats which match/mismatch to single processors.

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