THE INFLUENCE OF ASSESSMENT TYPE ON STUDENTS KNOWLEDGE LEVEL – A CASE STUDY

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Abstract

During their studies, students take various courses containing theoretical modules (lectures, exercises, seminars) and practical ones (laboratories, projects). Each course is designed in such a way as to give students knowledge and skills. The level of knowledge or skills depends on the course form, trainer experience and involvement and assessment type. The goal of this paper is to examine if there is a serious influence of the assessment form on students’ knowledge and skills. To confirm or reject this statement we put forward four working hypotheses:

• H1: Student-friendly assessment type allows to obtain higher skills than the unfriendly one;
• H2: Student-friendly assessment type improves permanent knowledge memorisation;
• H3: A few tests during a semester, covering parts of the course and allowing material review, cause better knowledge memorisation than one final exam covering all the course material;
• H4: Short tests before practical classes motivate students to be better prepared for classes.

To confirm these hypotheses, we surveyed a group of 27 Computer Science students to ask them about their experiences in the research area. The students had experiences with the following types of assessment:

• final exam – one exam, at the end of the semester, including the whole course content,
• colloquium – an exam including a part of the course content (usually a half),
• final project – one big project, rated at the end of the semester,
• short test – usually done before laboratory classes to verify how well students are prepared to do the tasks in the lab,
• reports – written documents describing the performance of a particular task in a lab; on the basis of a report the teacher gives a grade.

The results obtained in the survey analysis revealed that students described projects and reports containing practical problem solving as friendly types of assessment. They also noticed that projects and reports allowed for easy skills gathering. This is because both of them concern practical cases. A survey about knowledge memorisation gave ambiguous results. Various assessment forms were regarded by students as the best for knowledge memorisation. Surprisingly, students did not consider small tests as the best form of assessment, although this allows for learning smaller parts of the course content and for knowledge repetition. The short tests before practical classes also aroused controversy. Only some students confirmed that this form of assessment motivated them to be better prepared for classes. Short tests before practical classes were also rarely mentioned as helpful in knowledge memorisation. In contrast to the above, the statistical analysis of grades obtained by students in the final test proved that students who had short tests before practical classes got better rates.

The results obtained proved that the form of assessment influences the students’ knowledge and skills level.

Keywords: knowledge assessment, higher education.

1 INTRODUCTION

The Lublin University of Technology (LUT) trains students in various fields. One of them is computer science (CS). Because of a high level of requirements set by IT firms for candidates, universities must keep a high level of education. This paper describes a study that tries to examine the influence of assessment form on LUT CS students’ knowledge and skills level.
Assessment is an inherent part of each course taken at the university. It is done because of the necessity to motivate students to learn and to assess their knowledge, for reasons such as: rating students, granting scholarships, eliminating students who did not master the course material, assessing the quality of teaching, and many others, but the main goal of the university is to give students maximum knowledge and skills. In computer science studies, where the research was done, one of the most important aspects is to adjust the curricula and teaching material to employers’ (IT firms’) requirements [1], [5], [6], [7], [8]. This gives students a better position in the labour market.

It is necessary to influence students in such a way as to maximise the amount of knowledge and skills obtained by them, and make them permanently remember the course material, and train them in practical applications of knowledge [11]. This can be done in various ways, such as:

- using various forms of teaching (theoretical and practical ones),
- creating flexible time tables to make it possible for students to have part-time jobs in ICT industry, which allows them to gain additional skills and increase their satisfaction from studies [4], [10],
- interesting students in taught content, doing the practical tasks. An examples cases were discussed in [3] and [16], where students were engaged in a historical 3D visualisation,
- using modern educational equipment [3], [14], which allows students to train on professional hardware and software,
- cooperation between university and industry in the educational process (apprenticeships, practicals, creating master thesis under professional ICT care, courses done by IT professionals) [6], [15],
- additional materials for students given in interesting form [12],
- teacher engagement improving the quality of the educational process,
- learning by doing – interdisciplinary projects [2] and design thinking methods [9],
- experimenting with assessment form.

It is obvious that if a course does not end with an examination, then at least some students do not learn. If a positive exam result is a condition of finishing the course, we can be sure that all students will learn at least a portion of the material in order to pass an exam. Of course various forms of assessment demand various preparation and allow for checking various skills or knowledge or even testing the understanding of the topics and the ability of drawing conclusions. Of course to obtain reliable examination results it is necessary to ensure independent work of every student by controlling them during the examination or by using an anti-plagiarism system in the case of projects prepared outside of the class [13].

The main aim of the article is to check if assessment form influences in any measurable way the level of skills and knowledge acquired by students.

2 ASSESSMENT

2.1 Forms of assessment

Various forms of assessment can be met. In our research we focused on the most popular ones, commonly used in CS studies. They are:

- final exam – one exam, at the end of the semester, including the whole course content, used to assess knowledge acquired during lectures,
- colloquium – an exam in theoretical knowledge or a practical skills check, including a part of the course content (usually a half or a third),
- final project – one big practical project, including solving a complex problem, rated at the end of the semester,
- short test – usually done before the laboratory class to verify how well students are prepared to do the tasks in the lab,
• reports – written documents describing the performance of particular tasks in the laboratory and containing some conclusions; on the basis of the report the teacher gives a grade.

2.2 The research problem formulation

The goal of this research is to examine if there is a serious influence of the assessment form on students’ knowledge and skills. We also wanted to know if friendly assessment helps students in learning because of a lower stress level. To confirm or reject these statements we put forward four working hypotheses:

- H1: Student-friendly assessment type allows to obtain higher skills than the unfriendly one;
- H2: Student-friendly assessment type improves permanent knowledge memorisation;
- H3: A few tests during a semester, covering parts of the course and allowing material review, cause better knowledge memorisation than one final exam covering all the course material;
- H4: Short tests before practical classes motivate students to be better prepared for classes.

2.3 The research method and its implementation

To carry out this study, the survey method was used. The questionnaire consisted of two parts:

1. Basic information about respondents (sex, age, employment),
2. Main section containing questions to verify the hypothesis.

Surveys were conducted on a group of CS students just after the 5th semester. A group of 27 randomly chosen students were surveyed.

3 RESULTS

Verification of our hypotheses was started from identifying student-friendly forms of assessment. We asked students the question “Which form of practical classes assessment do you consider as friendly for students?”. Students could give their own answer or choose one of the given possibilities: colloquium, final project, reports or short tests before classes. Only one respondent (male) indicated his own answer. He suggested that checking the quality of the tasks performed during classes is a friendly form of assessment for him. The rest of the group were choosing among the ready answers. The answer distribution in the pool is presented in Figure 1.

![Fig. 1. The distribution of answers to the question “Which form of practical classes assessment do you consider as friendly for students?”](image.jpg)

Analysis of the graph presented in Figure 1 reveals that students prefer being rated on the basis of practical cases created on their own. The common aspect of reports and final projects is that they can both be finished at home. During classes students are told how to prepare solutions and what techniques it is worth using. A general proposal of the solution is given. Detailed problems are left for
students. Students’ reasons for considering these forms of assessment as friendly included: no time pressure, possibility of testing various skills and doing something practical.

The next question was “What form of practical classes assessment helped you to acquire the highest level of skills?”. Here students could give their own answers or choose from ready possibilities: colloquium, final project, reports, short tests, or they could indicate that assessment form had no influence. The answer distribution is presented in Figure 2.

![Fig. 2. The distribution of answers to the question “What form of practical classes assessment helped you to acquire the highest level of skills?”](image)

Analysis of the results obtained shows that about one fourth of the respondents thought that assessment form had no influence on the skills obtained during studies. A majority (over 65%) of respondents considered practical forms of assessment (final project and reports) as the ones helpful in getting the highest level of skills. These forms of assessment were also considered as friendly for students. This allows us to verify H1.

To examine if the memorisation of knowledge is related to assessment form we included in our survey the question “What form of assessment helped you to permanently remember information from lessons?”. The results are shown in Figure 3.

![Fig. 3. The distribution of answers to the question “What form of assessment helped you to permanently remember information from lessons?”](image)

The results presented in Figure 3 show that over one fifth of the respondents thought that knowledge memorisation and assessment form were independent. Over 55% of the respondents regarded friendly forms of assessment (reports and final projects) as best for remembering knowledge from classes. As there was no significant majority, we consider H2 as partly verified.
To examine H3, students were asked the question “What form of lecture assessment made you best remember the content?”. They could choose one of the given answers: colloquium, final exam, short tests before classes, or no influence. The results obtained are shown in Figure 4.

![Fig. 4. The distribution of answers to the question “What form of lecture assessment made you best remember the content?”](image)

Analysis of the answer distribution presented in Figure 4 shows that one third of the students did not notice the influence of assessment form on knowledge memorisation. The same proportion of respondents considered a final exam as a form that helped in remembering lecture content. Because a minority of respondents found short tests and colloquia as best for this purpose, \textbf{H3 was not verified.}

Short tests are often done by teachers just before laboratories. Over 80% of teachers underline that this is an effective tool to force students to learn systematically and to have the theoretical knowledge necessary to do practical tasks and understand them. We asked students if they confirmed this opinion. The question was: “Were you better prepared for doing tasks because of a short test at the beginning of the laboratory?”. Over 53% of students confirmed this opinion. The rest of them answered that there was no influence of short tests on their preparation.

The last question was “Which form of laboratory assessment do you consider as the least effective?”. Here students could choose one of the given answers or indicate their own opinions. Everybody marked one of the ready answers. The results are presented in Figure 5.

![Fig. 5. The distribution of answers to the question “Which form of laboratory assessment do you consider as the least effective?”](image)

As can be seen from Figure 5, students thought that short tests were the least effective form of assessment. Because of this and because only a little over one half of the students confirmed that they were better prepared for laboratories because of short tests, we consider \textbf{H4 as partly verified.}
4 CONCLUSIONS

The article is an attempt to examine the influence of assessment form on the students’ results. The study proved that, according to students, friendly forms of assessment are the most effective and allow for obtaining the highest level of skills. They also boost knowledge memorisation. This can be connected with the fact, that students create practical solutions and do something on their own. As is commonly known, the best way to learn is to do practical exercises.

Students did not find short tests and colloquia as the best forms of assessment. They preferred a final exam, even though it contained all the material from the semester. Also short tests were rated poorly. A great number of students did not find them advantageous or even consider as the less effective form of assessment.

As can be seen, various forms of assessment were rated differently. Students confirmed that there was an influence of the assessment form on skills and knowledge they acquired during courses. This proves that assessment form plays an important role in motivating students to learn.

REFERENCES


