FEEDBACK METHOD IN LECTURER-STUDENT INTERACTION

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Abstract. *The learning process at any stage involves direct interaction between the lecturer and students. The article discusses the lecturer-student relationship as one of the factors that influences the teaching process and improvement of learning materials on the example of the study course "Computer Science". The study aims at using the results of the survey, as well as student tests as a feedback method to improve the quality of the presentation of new material to first-year students considering the basic knowledge of obtained secondary education. The article discusses two methods of feedback: survey and testing. Survey is considered a method with high efficiency of obtaining information, a possibility of organising mass surveys, an ability to accurately process student survey results. Testing is viewed as a method to identify the level of knowledge and skills, as well as the abilities and other qualities of the educator to meet certain standards by analysing the ways, in which a student performs a number of special tasks. Both methods perfectly complement each other and provide an opportunity to more objectively analyse the learning situation. The article presents the results of the study on the example of the study course "Computer Science" for three academic years, describes changes in the structure of the course, as well as changes in the conduction of practical classes within the course, which improved student performance.*
Keywords: *feedback, lecturer-student interaction.*

Introduction

Education in the modern world is becoming one of the most important factors that ensures economic growth and social stability. The leading resources are innovation and new production technologies. However, the acceleration of the pace of technology updates leads to the need for a change in approaches, development of educational content and learning technologies.

The need to introduce innovative changes in the professional training of students is also due to the fact that today future leaders and employees need not

only to have a deep knowledge, but also the ability to quickly acquire new knowledge and use it to design their own activities and activities of subordinates.

Traditional education, when students were given ready-made knowledge, turned out to be ineffective, since it was not always that theoretical knowledge was consolidated and used in practical activities simultaneously with its gain. As practice shows, in most cases the transfer of ready-made knowledge does not always encourage a person to be ready and able to identify and analyse problems and independently determine the ways to solve them. In this regard, a completely different approach to the organisation of training of specialists is required, as well as a different system of relations and interactions between academic staff members and students (Ragozina, 2010; Antsiferova, 2016).

The study process at any stage involves direct interaction between academic staff members and students (Mulliner & Tucker, 2017), (Tan, Whipp, Gagne, & Van Quaquebeke, 2018). Sustained psychological and emotional contact of the lecturer with the audience is undoubtedly a decisive condition for the success of all types of activities. Each student should feel that s/he is not separated from what is happening, is not left on the periphery of the problem being discussed, but is involved in the discussion, has the opportunity to express his/her opinion on an equal basis with others. Successful feedback establishment allows the lecturer to more effectively organise training sessions considering the personal characteristics of students, as well as guide the process of the formation and development of skills for self-educational and professional activities (Van der Kleij, Eggen, Timmers, & Veldkamp, 2012). In this case, his/her position will necessarily be considered and will receive an objective assessment. Control is an essential component of the study process. It is carried out at all stages of academic work, provides "lecturer-student" feedback and serves as a basis for improving the quality of education.

The present article discusses two methods of feedback: survey and testing. The results of the research into the course "Computer Science" are provided, the changes in the structure of the course and in the conduct of practical classes within the course are described, and the influence of the feedback method on the students' performance is shown.

Models and Methods of "Feedback" in the Educational Process

The higher education system is aimed at ensuring high quality of education through the introduction of state education standards, the development of innovation activity, the development of a flexible education management system,

the creation of sociocultural space, the formation of specialist competence (Statement of the Third Bologna Policy Forum, 2012).

In this context, the interaction between academic staff members and students, i.e., "feedback" acquires special significance. In pedagogy, the concept of "feedback" is primarily associated with the need to monitor student performance. The implementation of the current, intermediate and final control over the students mastering the curriculum is an integral part of the educational process. The fulfilment of certain written and oral tasks by students, aimed at identifying the degree of mastering academic disciplines and willingness to apply this knowledge for practical purposes, determines only one of the sides of the feedback process.

There are several models of feedback (Fig. 1).

In the first model (Fig. 1, a), the lecturer is the main actor and leader of the course, and the students act as passive listeners. The second model assumes that academic staff members and students interact with each other during the class, are active participants and are on equal rights (Fig. 1, b). The third model, in turn, focuses on a wider interaction of students not only with the lecturer, but also with each other and demonstrates the dominance of students' activity in the study process (Fig. 1, c).
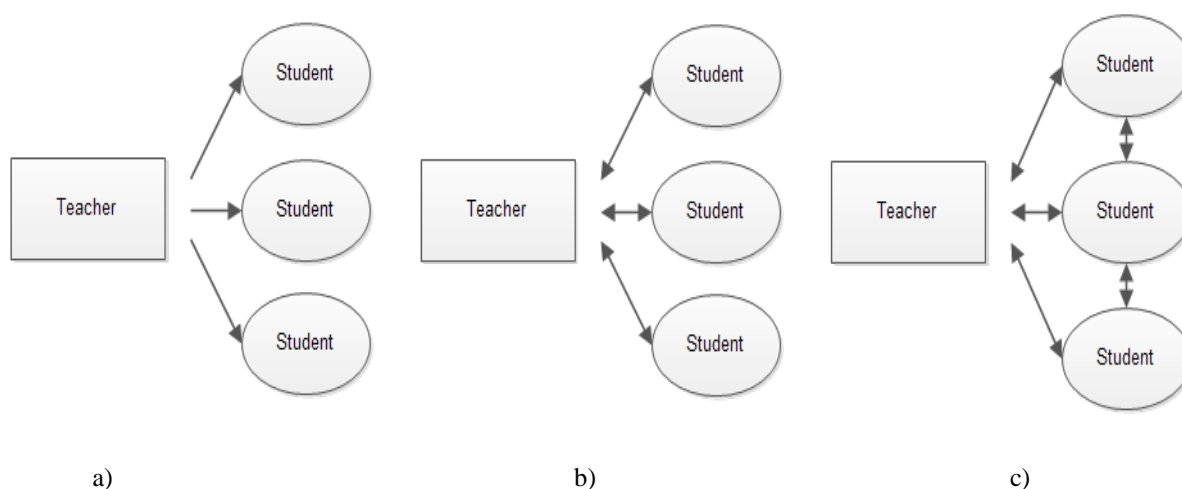

a)   b)   c)

*Figure 1 **Models of Feedback** (Vinnik, 2018)*

Basically, feedback is a two-way process, which involves receiving and studying opinions of the trainee (student) and the educator (lecturer).

Depending on the students' answers, the stages and content of the course can be adjusted (Prokofjeva, Uhanova, Zavjalova, & Katalnikova, 2015). Feedback allows academic staff members to get an idea of the dynamics and completeness of the process of mastering knowledge and development of trainees, and for

trainees – evaluation of their activities, advice on how to correct them, thanks to information about shortcomings and achievements (Bessonov, 2016).

Tools and methods of feedback, such as diagnostic surveys, input, intermediate, boundary, final, group works, essays on a given topic, etc., contribute to the increase in the effectiveness of mastering study courses. For the analysis and correction of the activities of students and lecturers, there are questionnaires, group discussions, as well as new ways of feedback: e-mail, forums, chat rooms and blogs. Successful establishment of feedback allows the lecturer to organise learning sessions more effectively considering the personal characteristics of students, as well as directing the formation and development of abilities and skills for self-educational and professional activities. It is the presence of a stable contact with students that determines the professional level and the true authority of the lecturer.

Research Results

Over the past two years, an experiment was conducted, in which first-year students of the Faculty of Power and Electrical Engineering participated. Survey and testing of 194 respondents were organised on the study course "Computer Science" (2017/2018 – 112; 2018/2019 – 82).

The conducted survey contained 10 questions, some of which were: "What education did you get before entering the RTU (where and when)?", "Evaluate your skills in using Word, Excel, PowerPoint (excellent; average; below average)", "What programming languages have you used before entering the RTU?", "Which of the following operating systems have you already used: Windows, Linux, other _____?", "Which of the following subjects are more closely related to the subject "Computer Science": mathematics, physics, chemistry?". In essence, students were asked to independently evaluate their knowledge and skills of using operating systems (Windows, Linux), text editors (MS Word, OO Writer), table processors (MS Excel, OO Calc), programming languages (Pascal, VBA and other languages), as well as their knowledge of mathematics and physics.

The results of the survey were obtained. Some of them are presented in the Table 1.

Table 1 **Survey results**

2017/2018 academic year, I year	2018/2019 academic year, II year
76% of respondents entered the university immediately after graduation	80% of respondents entered the university immediately after graduation
Word: excellent - 74%; average - 26% Excel: excellent - 27%; average - 72% PowerPoint: excellent - 74%; average - 26%	Word: excellent - 83%; average - 16% Excel: excellent - 44%; average - 51% PowerPoint: excellent - 80%; average - 18%
Pascal - 35.7%; VBA - 3.6%; other - 0%	Pascal - 46%; VBA - 7%; other - 0%
Windows – 99%; Linux – 0%	Windows – 96%; Linux – 2%
mathematics - 82%; physics - 30%; chemistry - 0%	mathematics - 78%; physics - 23%; chemistry - 0%

Testing of students was conducted during the first classes of the subject "Computer science". The proposed test consisted of simple mathematical tasks and computer science questions. The purpose of the test was to find out the level of students' knowledge on issues that are basic for solving laboratory tasks. For example, the task "Calculate n! with n=5" was correctly solved by 21% (I academic year) and 23% (II academic year) of respondents. Tasks, which include questions on trigonometric functions and tasks for calculating the sum of series, were solved by an even smaller percentage of respondents (I year - 18%, II year - 17% and I year - 12%, II year - 16%, respectively).

Taking into account the results of the survey and testing received in the first year, the lecturer made adjustments to the teaching process of the study course "Computer Science". Results allowed, without changing the course syllabus, to "work out" the weak points in students' knowledge and offer more understandable examples, practical tasks and assessment.

Thus, for example, in the second year the lectures were supplemented with practical examples of solving mathematical problems, their explanations, as well as methods of implementation in the VBA programming language in Excel (Fig. 1, a).

Also, in the second year short test tasks were drew up in printed form for use in practical exercises. All these tasks were not evaluated explicitly, but examined in practical classes. At the same time, students were not forbidden to help each other with the solution; the "check friend's work" technique was often used (Fig. 1, c).

As a result, the ability to adjust teaching materials, identifying more difficult topics and paying more attention to them, allows students to improve their academic performance, as shown in Fig. 2.
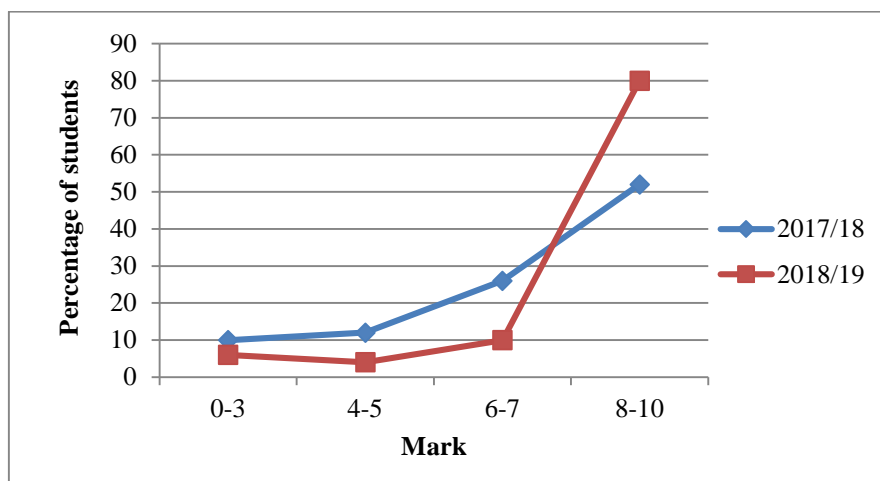
*Figure 2 **Student performance***

This survey, i.e., feedback from students significantly helps improve the content of the course, teaching methods, and provides improvement in student performance in the study course "Computer Science".

Conclusions

The feedback received as a result of the student surveys, if the correct conclusions have been made, allows lecturers to change or improve technologies which they use, choose the methodology that is optimal at the moment, design and use effective forms of work when delivering study courses.

Successful establishment of feedback allows the lecturer to organise learning sessions more effectively considering the personal characteristics of students, as well as directing the formation and development of abilities and skills for self-educational and professional activities. It is the presence of a stable contact with students that determines the professional level and the true authority of the lecturer.

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