Viktória H. BAKONY, Zoltan ILLES

Real-time and formative evaluation elements in university education in Hungary[1]

Ewaluacja w czasie rzeczywistym i ocenianie kształtujące w edukacji akademickiej na Węgrzech

Key words: formal education, evaluation, formative evaluation, university education.

Słowa kluczowe: edukacja formalna, ewaluacja, ocenianie kształtujące, edukacja akademicka.

Abstract. Nowadays we all are the witnesses of the rapid changes in technology around us, the changes in students' learning attitudes and the new demands of the labour market. These features altogether are inducing a pronounced alteration in university education as well because educators are urged to give an adequate answer for these challenges to ensure an effective learning environment. The main goal is to strengthen motivation and the self-assessment of students towards learning – which is needed later in lifelong learning process too. It is commonly known how important the immediate, real-time feedback is in the learning process, however going back only thirty years we find out that only a very few types of evaluations – mainly summative evaluations – were used in practice. The paper is focused on the evaluation systems being modified in education, especially at ELTE Informatics Faculty, Hungary.

Introduction. The technological explosion had happened in the last few decades caused the need of drastic changes in education. The internet and the enormous data available from everywhere and anytime superseded the booking used for centuries. Today understanding, lifelong learning and the ability of continuous rejuvenation are in the focus of education and needed extremely by the working market. A rapid transition between two different approaches is never easy. The traditional teaching and evaluation methods in education and the new learning methods of students did not function together well, it caused a big pressure on each of the actors. The alarm-bell was clanged as dropout from universities reached at about 40% in the field of informatics at the end of the first decade of the XXI-st century in Hungary meanwhile the working market needs more and more well-trained specialists. [1] Naturally this dropout symptom is not limited to any country or any type of trainings it is well-known all over the world and occupy researchers for a long while. They examined the possible causes and they state the reason is complex: financial problems, the student

[1] Przedruk [w:] J. Bojanowicz, K. Ziembakowska-Cecot (red. 2018), *Przygotowanie nauczycieli do nowych wyzwń edukacyjnych. Problemy współczesnej edukacji*, UTH Radom.

motivation, satisfaction and commitment. [2, 3, 4] Do not bury our head into sand, there is the low points of preliminary and the enlarging numbers of students in the auditorium among the reasons, the hundreds of first year students who are not really engaged, prepared for their career and meanwhile the professors are not able to give personal care to them. What can we do to help on this situation? I state as complex the problem as complex the answer should be! The work began and the first reassuring results was published in paper [1] presenting the success of learning methodology courses held for the first year students. Though we must not forget about the other aspects of the educational environment which strengthen the result. Year to year the preliminary points are higher and higher (2010-320p, 2015-335p, 2017-360p from *http://felvi.hu*) and the subjects are also changing not only the content of them but the teaching and evaluation methods used by them. If we follow the trends in university education we can find that formative evaluation, real-time feedbacks are used already in universities as well e.g. Trinity University (https://bit.ly/2HkCLuY) to fine tune the students learning engagement. In this paper I should like to focus rather to the appearance of new evaluation methods in our university program for programmer informatics.

Evaluations yesterday and today. The literature is dealing with evaluating schools, teachers and students but in the most important goal is always the same to make more effective the teaching process itself. [6]

First we have to have a glance at the philosophy of evaluation: it can be **competitive** or **non-competitive**. The previous one is using the healthy competitivity among motivated students. It works in the case of special talented groups in our faculty (called Neumann-groups) – but remember the researchers state that the absence of motivation is one reason of dropping out. In the case of non-competitive evaluation system the teacher is responsible for everything. The most symphatic evaluation philosophy is the **cooperative** one for myself – while it gives equal responsibility to the students and the teacher. [5]

From another viewpoint we can speak about **normative** (we compare the knowledge of the students), **criteria oriented** (the students have to reach a given knowledge level and the evaluation is successful or not) and at last the **standardized** evaluations. Nowadays there are some criteria-exams in some of the trainings, due to the students' very different knowledge level with which they arrive into university. For example such exams are from biology and from chemistry in ELTE on Biology BsC training. (*https://bit.ly/2pUJrct* in Hungarian).

At last we may classify the evaluation types according to their goals: they are **formative**, **summative** and **diagnostic** evaluations (some others are not relevant now). Diagnostic evaluations are at the beginning of a training or a course to map the knowledge of the students – they are not used frequently. For several years there was a diagnostic test to map the general informatics knowledge of first year students. Summative evaluations are usually at the end of a course to grade the students and finally formative evaluations are rather a process during the whole semesters to monitor the learning process and improve students' learning. [7]

Traditionally in universities summative evaluations are used where the goal of evaluation is mainly to graduate the students at the end of the semesters. In the 80th – 90th usually there were 2 written papers and/or an oral examination from theory at the end of the semester. During the term there were homework from practical courses and laboratory work with records – the results were discussed week-by-week– this meant the feedback of our knowledge and helped in self-evaluation (formative evaluation). The thesis was helped by a tutor giving a real excellent personal attention to students. Therefore the method and evaluation system was not various.

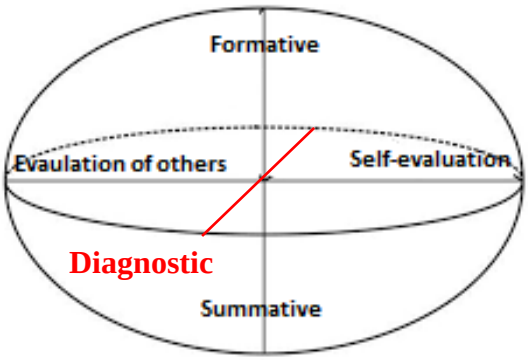

Fig. 1. Expanded graph of balanced evaluation (base from [8])

David Hopkins (Great Britain educational specialist) said that in teaching we must find the balance between summative, formative, inside (self) and outside (external) evaluations to produce an effective learning environment. [8] By my opinion this 2D oval should be developed into a 3D object giving place of the diagnostic evaluations as well. (Figure 1) According to the Bologna system where students somehow may vary the order of subjects it is not sure at all, what is evidence for the students in the moment and what is not – using diagnostic evaluation may solve the problem. It looks like to me that one of the reason why CRS (Classroom Response Systems) are so well-come is this. There are several ready-made CRS systems but we implemented a new one according to our special needs which was published previously. [9]

I would like to focus and give an overview about the newly used evaluation and teaching methods of our trainings but first I wanted to have a quick glance at other institutes as well. Are there significant changes in teaching methods and evaluation? I asked some students (https://bit.ly/2J6wEM5) from different universities what type of evaluations and teaching methods they experienced during their education. The collected data are far not enough for a relevant result but maybe we can sense that new type of methods **appeared in education** but for today only a fraction of the professors use them.

University	Teaching method	Evaluation method	Estimated usage of newness
ELTE elementary school teacher 2017-	Pairwork, team-work, project-work, mind-mapping	Oral feedback, self-evaluation, partner-evaluation, electronic evaluation system	40-60%
Semmelweis University 2010-2014	Presentation, pair-work, team-work	Oral feedback, collecting point to the final grade, team-work	0-20%
ELTE Romanistic-French 2010-2013	Presentation, pair-work, team-work	Homework weekly criteria exams	0%
ELTE IK 2017	Pair-work, project-work, e-book, e-task collection	Collecting point to the final grade, criteria exam, electronic evaluation	20-40%
KRE History 2009-2014	Presentation	Homework weekly, self-, partner evaluation	0-20%
BGF Touristic	Presentation, pair-work, team-work, project-work, interactive e-book	Homework weekly collecting point to final grading,	20-40%
BGF	Presentation, pair-work, team-work, project-work, interactive e-book	Collecting point to the final grade, criteria exam, electronic evaluation, self-,partner evaluation	0-20%

(The third answer with 0% is not relevant due to the previous two answers)

Evaluation types in Faculty of Informatics, ELTE. In this section we would like to focus the formative evaluation elements appearing in our faculty (ELTE, Budapest) in programmers and informatics teacher trainings – though most of them are not clearly formative evaluations because the final grade is not totally independent from the results. According to the literature using a formative evaluation teacher may find some general techniques like: making portfolio, frequent feedbacks, meetings (discussions), questions, student self-evaluation, partner-evaluation, team-meeting, collection of tasks, giving solution patterns and mind-mapping.

Let us see which ones of the above-mentioned techniques exist in our trainings now in the spring of 2018. I shall give the name of the subject and the used methods in each case.

Frequent feedbacks. From 2008 there are so called X subjects (11/55 from https://bit.ly/2uCHh69). The specialities of them is that there are much more feedbacks, small papers during the semester as usual. For example to get a grade from *Fundamentals of Programming* subject the student has to write 4 big homework, 10 small test, 4 exam test and all of them has to pass the given criteria (but they may retry them).

From *Operating systems* they have to implement two homework and they have to present it to the laboratory teacher who gives immediate personal feedbacks to the students – after it they may rewrite it if it is not quite good. They will not get a grade for the task, but the success of it may upgrade or downgrade the final mark at the end of the semester.

The previously mentioned E-Lection system also may be used as a tool for just in time feedbacks during the lectures. Today it is used only for exploring the actual knowledge of the students – it is not effecting the grade at all. [9]

There are *cooperative trainings* (4 month long) it means that the student is working somewhere in the industry and she/he has got two tutors one from the firm and one from the university – both of them help to be able to fit into the working environment as perfectly as it is possible. It naturally means personal meetings, advices, and discussions.

Finishing their education they have to write their *theses* with the help of a supervisor – similar to the traditional method. They meet frequently and discuss the problems – this personal help produces the final work. It helps to learn how to dig deep into a given topic and find new solutions personally.

During the doctoral studies e.g. in *Chapters from informatics methodology research seminar* time-to-time the students present their actual work to the supervisors and to their course mates and everybody may give advices, put up questions helping the work.

Self-, partner- and group evaluation, portfolio. *Web-developing I.* subject (obligatory) uses self- and partner-evaluation both of them will be part of the final grade. [11] Today we have to be very careful (personal data) to publish the results of the students. According to the Bologna system sometimes they do not know even the names of their course-mates. These facts discourage the inside self-evaluation process, the ability to compare themselves (the quality of their work) to each other. In this subject the evaluation is supported by an electronic system and they may work without knowing the name of the author of the evaluated work.

In *Programming methodology II* for informatics teacher the practice work is organized to team-work (3-4/team). Their self- and partner evaluation is one part of the final grade. In *Software development in practice* subject they have also project-work. In each week they meet, discuss the achieved results and evaluate personally the finished work. At the end of the semester they get final grade as the result of this group evaluation. [10]

Informatics and society subject (for informatics teacher) uses small presentations during the semester and the final grade is decided by the group' opinion.

During their university years teachers have to develop their portfolio which will be part of their final examination.

Solution patterns, interactive task-books. Almost each subjects offer some collected tasks and solutions through their homepages. But in our faculty there is a great public on-line task collection with several patterns in it (http://mester.inf.elte.hu) to practise programming using different languages. It contains at about 1000 tasks with different levels from novice to expert. Anybody and anytime may use it to develop his or her programming ability. It is very useful when there are students with different pre-knowledge in the same group. The teacher may give and check easily a differentiated work to everybody. [12]

In subject *Computer thinking* this method is often used but it is used in *Fundaments of Programming* as well not only for Hungarian but for English students.

I have to mention that maybe there are colleagues who uses some other techniques in their teaching process but I wanted to collect and present only those practices which are specific to a whole subject and not only to a given course.

After all we may state that we are tending towards a modified evaluation system with using formative elements hoping that it will be one useful tool to stop dropouts from university and increase the effectivity of education. The trends of dropout decreased in the last two-three years [1] but it would need further research to decide how much of this trend was caused by directly the offered methodology training, the modified evaluation system and the increasing preliminary points.

Summary. The changes in technology, in the need of working market and in the habits of learning force universities to change their traditional methods to improve education and stop dropouts. The reasons are complex one element of the solution among others may be the modification of their evaluation systems to give continuous feedbacks using techniques of formative evaluation. In this paper we presented the appearing elements of formative evaluation used in ELTE FI in 2018. Next year we shall start with a new curricula. A new curricula means new subjects, new methods and from a point of view a new evaluation system. The worked out techniques will be used further and new pedagogical experiments will start.

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Viktória H. BAKONY
Department of Media and Educational Informatics,
Eötvös Loránd University Budapest
e-mail: hbv@inf.elte.hu