

Students' activity during online distant training in conditions of COVID-19

Dineva Snejana¹, Nedeva Veselina²

1-Trakia University, Faculty of Technics and Technologies, Food Technology, Yambol, Bulgaria; E-mail: snezhana.dineva@trakia-uni.bg

2-Trakia University, Faculty of Technics and Technologies, Department Electrical Engineering, Electronics and Automation, Yambol, Bulgaria;
E-mail: veselina.nedeva@trakia-uni.bg

Abstract

The pandemic situation accelerated synchronous and asynchronous online teaching, training, and assessments that enhance students' activity in the virtual learning environment (VLE). Compared with the blended learning the students' activity in the VLE amplifies due to the prohibited meetings and restricted social life replaced with the implementation of a virtual classroom. During quarantine, the students from Trakia University attended virtual classrooms created with BigBlueButtonBN in Moodle or using Google meet. They followed the announcement published online like notice on the course page or on Facebook, or in Messenger. Social isolation did not have an adverse effect on the study process in the university. Controversy, many new online resources were prepared and applied, students and teaching gain new knowledge and experience to work in VLE and communicate through audio and videoconference connections, and meetings. The Trakia e-University well coped with the pandemic situation, following the instructions of governance and using Moodle online platform with well-organized curriculum courses for departments and units, with lectures, e-books and tests for self-training. The academic staff received adequate support and efficient training to use the possible online tools for management and admit teaching.

Keywords: on-line learning, distant learning, students' activity, COVID-19

Introduction

The COVID-19 pandemic caused enormous tension, stress and disaster on all kinds of human social activity all over the world, but education was considered less affected, even all schools, kindergartens, colleges, universities, and other educational institutions have been closed. According to Bulgaria's Ministry of Education data, 90% of students have transferred to distance learning and online education. In Bulgaria, the special measures regarding the diminishing of virus spread were adopted on 13 March 2020, and all events involving young people were banned or postponed. People start to live in a new situation that requires them enormous changes and exerted on them a dramatic impact with consequences and still unpredictable end.

Comparing all social spheres of life activities many of which fall in deep crisis, the education remained less affected. Most schools and universities succeed to adapt fast to the novel challenges moving their lectures and courses online. Teaching and student assessments were moving on an untested and unprecedented online scale (Burgess & Sievertsen 2020). The pandemic COVID-19 fast-tracked digitalisation with all its pros and cons, distant online education starts to be applied (<https://bnr.bg/en/post/101253673/covid-19-bulgaria-goes-online>).

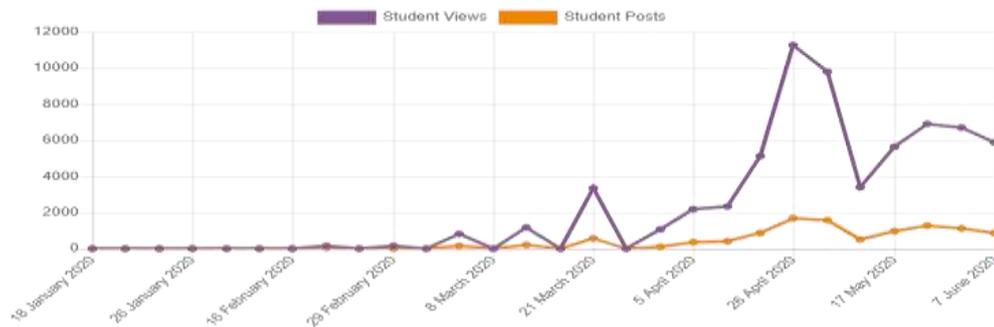
Ordinary, the universities used their existing online distance courses, while the schools created distant connections with pupils using free online education resources supplying from technology companies, for example Microsoft Teams. The recommendations of OECD (Organisation for

Economic Co-operation and Development) were followed for using the existing online distance learning platforms, developing new online teaching platforms (virtual classrooms), collaboration with private educational platforms and international existing online educational resources, using all electronic means as appropriate (streaming lessons on TV), providing teachers with digital learning opportunities (OECD 2020).

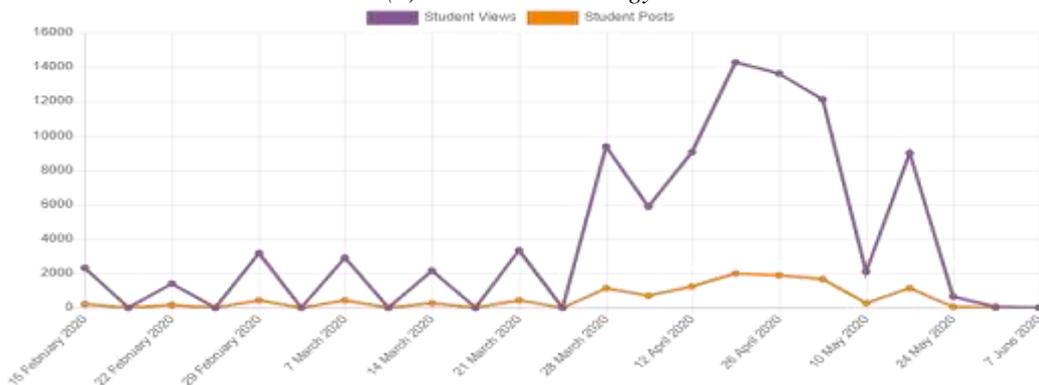
Students' activity during quarantine in VLE

The COVID-19 pandemic, threatens education progress globally, through two major shocks: schools closing and economic recession. According to the World Global Bank tutoring to cope with the crisis, the policy responses should be quickly moved to distant digital learning that mitigates the effects and turns the retrieval into a new opportunity (WBG 2020).

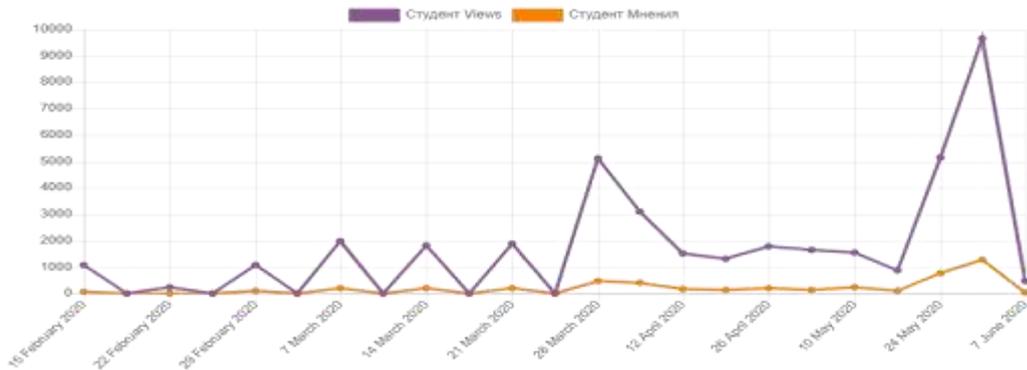
The results in the article are drawn based on the statistical approach available in Moodle for managing the study process using reports for the e-courses of Microbiology, Ecology and Biochemistry. During 60 days of quarantine, the learning process at Trakia University continued using only online teaching, support, and assessments, which correspondingly increased students' activity in VLE like views and posts (fig.1 a, b and c).



(a) Course Microbiology



(b) Course Ecology



(c) Course Biochemistry

Figure 1. Students' activity during COVID-19
(a) Microbiology; (b) Ecology; (c) Biochemistry

The students have plenty of different courses at different days and periods following their curricula, and the students' activity in VLE intensely accelerated after 13 March 2020, with picks well coincident with the appointed meeting from week schedule (fig.1, a, b and c). Mostly the students and teachers intensively start to use virtual classrooms creating through BigBlueButtonBN in Moodle or Google meet, which resulted as increased of students' viewing activity in VLE (see fig. 1a, b and c).

The activity of students using multimedia e-books during COVID-19 also increased (fig.2), it enhances approximately two times in comparison with the pre quarantine period.

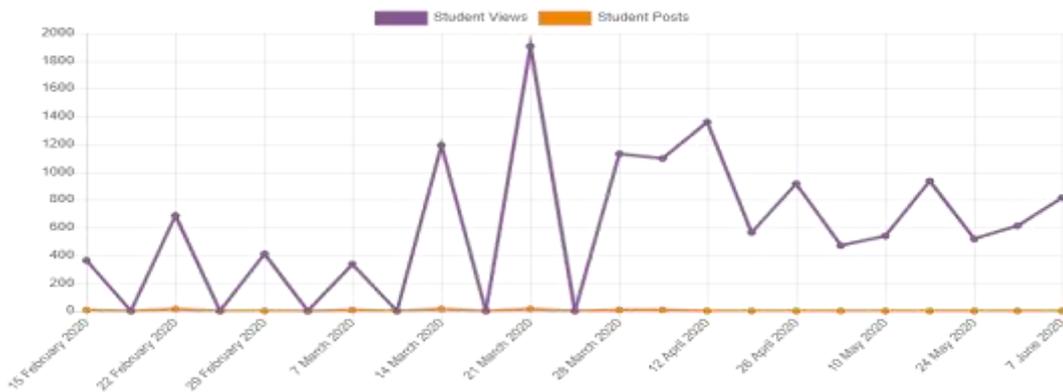


Figure 2. Students using multimedia e-books during COVID-19

According to Basilaia & Kvavadze (2020), VLE is sufficient for schools and higher education to carry the learning process. It supplies numerous forms of distant online learning as knowledgebase courses, online support, asynchronous, synchronous training, online audio and video communication used from the lecturers of Trakia University provided to the novel experience.

The analysis of the student activity during the pandemic of COVID-19 in the second semester in the courses Introduction to computers and programming (C++) and Web programming (JavaScript) in FTT - Yambol can be summarized as follows.

The lectures and workshops were held online in a virtual classroom using web-based learning platforms. The Trakia Electronic University (TrEU) based on Moodle offered additional video lectures and materials to students, visualizations of algorithms, and solved tasks. To have feedback with them, the following was done:

Activity 1: Attendance at online lectures, which were held with Google meet as part of G Suit for education - Registration of Trakia University (www.trakia-uni.bg);

Activity 2: Assignment of individual tasks for writing program code, which each student had to solve by the deadline and upload the program code and a screenshot of the solution of the task in TrEU;

Activity 3: Ongoing tests for the study material, which covers the theory and practical knowledge that students must have.

The individual C ++ programming tasks aim to increase and develop the practical results and skills for dealing with non-standard algorithms. The group of students in the course Introduction to computers and programming consists of 21 students, of which 14 (67%) have submitted their completed tasks by the deadline, which is a satisfactory result. The others were allowed to present the solutions of their tasks later to the end of the semester.

To activate and accelerate this feedback, and to increase student achievements, additional incentives were provided for those who coped successfully. Everyone's work was evaluated individually by commenting on each presented task and digital or point evaluation of the achievement. As an additional encouragement for the best decisions made on time, points are given that increase the student's chance of being released from the semester exam.

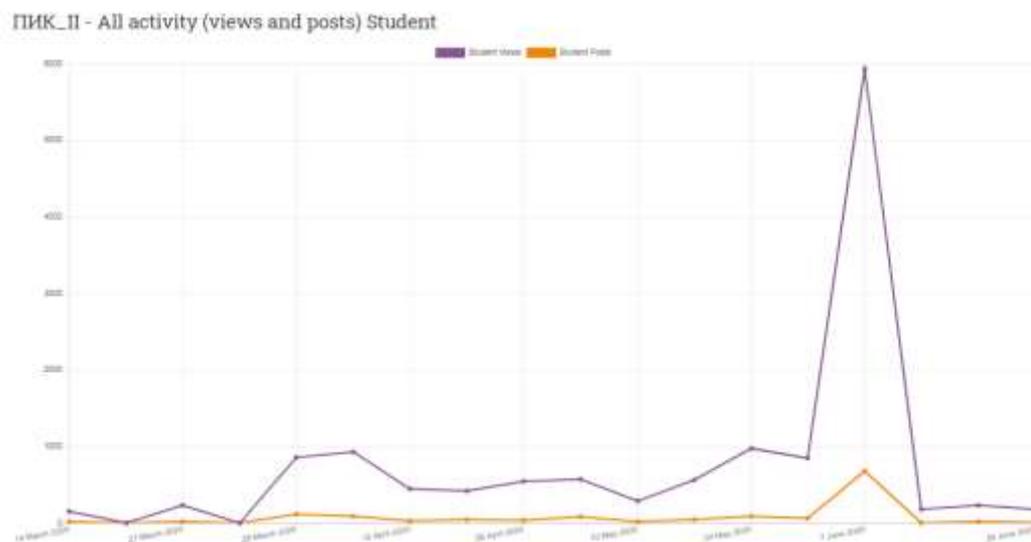


Figure 3. Student's activity in Subject Introduction to computers and programming during COVID-19

The analysis of the activity in Fig.3 shows that the greatest activity of the students was during *Activity 3*, i.e. the tests at the end of the semester 7-14.06.2020; on the second place was *Activity 1*: the online lecture attendances; and on the third place *Activity 2*. The conclusions were made during the semester and this activity was given special attention. Online visualizations of solved tasks were offered to the students through the website <http://pythontutor.com/> to be able to follow the solution step by step and to cope with the tasks for independent work (Fig.4).

There is a similar situation in the Web programming course (Java Script). The tasks assigned to the students were for different periods and with different deadlines. Out of a group of 16 people, 11 submitted the JavaScript tasks in time, i.e. about 69%. To improve this result, solved sample tasks were proposed for each lecture. The approach of using examples with visualization of the solution divided into steps is also applied here (Fig.4).

In both courses to each lecture is offered solved sample of programming tasks that facilitates students' preparation, both for the practical exercises and for the semester exam. Part of sample tasks contained in addition to the program code as a block diagram of the algorithm for the solution; a video clip for a creating the program or additional explanation to the condition of the task.

In some cases, there is a visualization of the computer program presented in steps of implementation (created in the online platform <http://pythontutor.com/>), embedded in TrEU. Students have the opportunity to repeatedly perform the program or some steps of it by observing what happens in the Stack or Heap of memory (or Frames and Objects) at each step: e.g. how to enter the values in the individual elements of the array; how the memory cells change for the defined variables; what is printed on the console, etc. In Fig.4 can be seen that the steps for the implementation of the program are 87; the current step is 64; the console and the contents of the memory at the time.

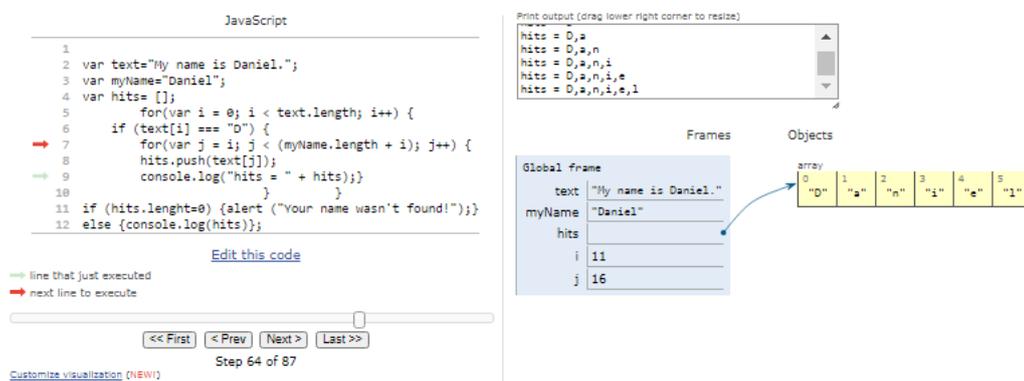


Figure 4. Visualization of the program embedded in TrEU.

Students and teachers remarked that received more homework's using online training. The tools as online schedule, Facebook, Messenger, direct phone calls, or emails have been successfully used for the organization of the study process. Attendance raised on the online virtual classes, and was approximately 90%, for the study courses.

Conclusions

The FTT– Yambol, in Trakia University well manages transitions of traditional to online education in a pandemic situation, following the instructions of governance, using Moodle online platform with well-organized courses and support materials, including lectures, e-books and tests for self-training and assessment. The academic staff and administration received adequate support and efficient training to use the possible online tools to manage and admit teaching. Therefore, the conversion of traditional to online education was successful. The social quarantine did not exert a negative impact on the learning progress. Controversy, many new online resources were prepared and applied, students and teaching gain new knowledge and experience to work and connect in

VLE through audio and videoconference connections, and meetings. Moodle's statistics revealed that pandemic situation speeded synchronous and asynchronous online teaching and increase students' activity in the virtual learning environment.

During the quarantine, all various methods of online learning have been applied, from the lecturers of Trakia University, which immediately received instructions on how properly to work, attend online forums, some of the additional training. Consequently, the existing VLE in e-Trakia University enriched with new resources and novel tools. The teachers and students gained new knowledge and experience useful for the future. Students' enrolled online learning system successfully pass exams. Nevertheless, the excellence of learning online needs further examination.

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