

# MOODLE PLATFORM' SUPPORT IN DIGITIZING THE ACADEMIC PROCESS. CASE STUDY WEST UNIVERSITY OF TIMIȘOARA

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— **FULL PAPER** —

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## Abstract

The West University of Timișoara implemented the E-learning Moodle platform 15 years ago. During this time, several other platforms integrated onto it to allow digital resources and activities flexibility. The university sought to identify the best solutions for efficient transmission, grading, feedback, recording of the students' work, and the examination process. For this purpose, at the level of our university, we developed the Learning Management System (LMS) through plugins and customized reports to design and develop academic processes more efficiently. This paper presents the main academic processes carried out on the Moodle platform, which led to the inclusion of this platform in the future digitization strategy of the university.

**Keywords** – Moodle, e-learning, digitizing, academic process design

## 1 INTRODUCTION

Like most universities, the West University of Timișoara uses several IT solutions to handle large databases and information regarding students, professors, learning plans, payments, registry books, study documents, certifications, and individual student status. The integration of the Moodle platform as an LMS in the Management Information System (MIS) of the university was a necessity for data synchronization, for the development of the digital learning environment, the improvement of digital student feedback, the development of digital skills for students, and the digital assessment process.

The development of the online format educational process required a consistent technology that allows the development of learning materials, the achievement of face-to-face workshops, assessments, and support sessions for exams and dissertations. For this purpose, the LMS was developed through plugins and customized reports to monitor and support the educational process.

This diversity of solutions and platforms used in the educational process, ensuring a system of protection and security of data and users of these platforms to ensure quality standards in the teaching process, led to the development of a digitization strategy at the university level.

The Moodle e-learning platform has been an essential pillar in this strategy, aiming to simplify using new digital technologies and working methods. It ensures compliance with common standards throughout the university and digitizes academic processes according to assessment requirements required by quality standards.

## 2 USING MOODLE IN THE TEACHING PROCESS

### 2.1 Bachelor and Master Study Programs

The flexible and student-centered approach of the educational process, regarding time, place, and individual rhythm of study in all levels of university studies, led to the introduction of Moodle LMS as the online education platform for the distance learning study programs at the level of the West University of Timișoara's educational offer, for the past more than 15 years. In the beginning, the implementation of the platform was available for the development of university study programs offered in the forms of Distance Learning (DL) and Low-Frequency Education (LFE). The development of the educational process and teaching-learning-assessment methods required consistent technology to develop learning materials and student outcomes, achievement of face-to-face workshops, assessments, and support sessions for exams and dissertations. This process led to the Moodle platform for all study programs as a primary tool or a blended learning teaching method.

The 2020 lockdown determined the university's study programs to switch to the online format. It incurred a lot of challenges generated by the diversity of programs in a comprehensive university with STEM-type fields, like business education, sociology, psychology, and vocational fields (arts, music, sports). The challenges included creating teaching resources for supporting a digital curriculum and adapting professors' teaching strategies to manage the online educational process.

Professors' workshops and tutoring on the presentation of models used today to design learning contributed to achieving the targeted result, namely the increased number of professionally developed courses.

The Faculty of Economics and Business Administration (FEBA) uses only the LMS platform, and during the pandemic context, we witnessed increased usage of the e-learning Moodle platform (Table 1):

|  | 2019-2020 | 2020-2021 | Variance        |
|--|-----------|-----------|-----------------|
| <i>Number of courses</i>                   | 292       | 454       | 55,48 percent   |
| <i>Total accesses</i>                      | 40.313    | 972.045   | 2311,24 percent |
| <i>Average accesses/course</i>             | 138       | 2.141     | 1450,84 percent |
| <i>Max. no. of unique users/ course</i>    | 107       | 184       | 71,96 percent   |
| <i>Max average of user accesses/course</i> | 34        | 189       | 455,88 percent  |

**Table 1 – Usage of the LMS platform for the last two Academic Years**

Statistics provide a significantly increased dimension of professor-student interaction in the first semester of the academic year 2020-2021 versus the first semester of 2019-2020 for online format activities [1].

### 2.2 e-learning UVT - customized Moodle App

The need for communication and access to educational resources from anywhere led to the implementation of the personalized mobile application. The university's strategy for digitization and accessibility of the educational process includes this app. Students and professors mainly use the application for communication and to monitor the course activities (Figure 1).

The customized application for the West University of Timisoara is "eLearning UVT". It is available in Google Play and the App Store from the beginning of this academic year (September 2021). Table 2 shows the number of devices that downloaded the app in the first two months after it was available and the number of notifications sent through Moodle Apps.

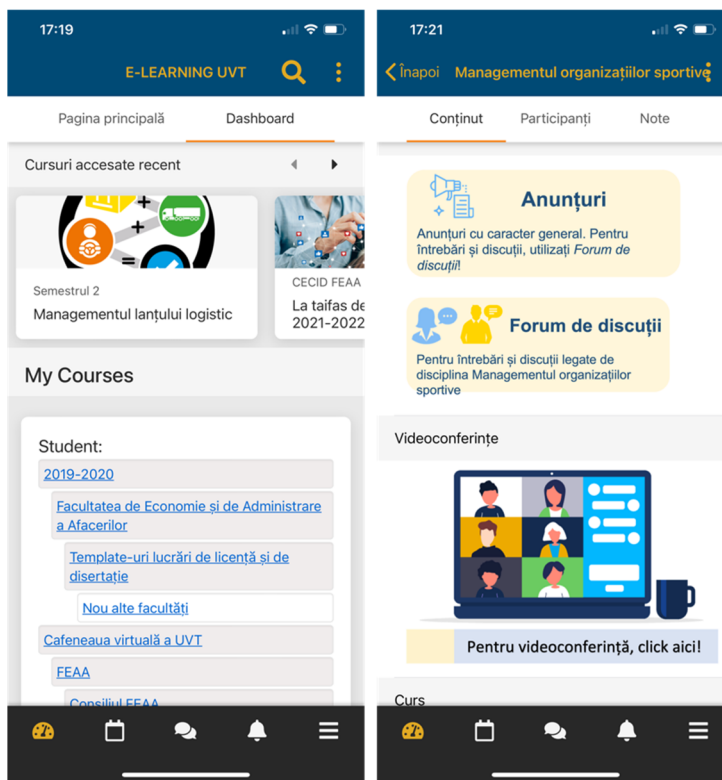


Figure 1: UVT customized Moodle app (eLearning UVT)

| Year | Month | Notification Sent | Active Devices | New Devices |
|------|-------|-------------------|----------------|-------------|
| 2021 | 10    | 36.820            | 2.087          | 2.927       |
| 2021 | 9     | 1.102             | 228            | 458         |
| 2021 | 8     | 0                 | 0              | 0           |

Table 2 - Devices receiving notifications on eLearning UVT

### 2.3 Transfer of Good Practices by Postgraduate Programs

Knowledge, experience, and good practices in carrying out teaching activities in the online environment based on the university LMS Moodle made possible the realization of a postgraduate study program for middle school teachers. Thus, in June 2020, the first series of the postgraduate program "Educational and Digital Resources for Online Training" began, and since, it has had three groups of graduates. The aim of including LMS Moodle in the curricula of this postgraduate program was to offer skills development opportunities for the teachers' community. During the program, learners acquired the skills to use digital resources and tools in teaching-learning activities efficiently. They improved their communication and collaboration skills using and implementing good practices to create digital content and teach.

### 2.4 Management Reports for the Teaching Process

We use reports with filters regarding the faculty, the form of education, and the academic year, to monitor and manage the teaching process. These reports also contain:

- The total number of professors who accessed the platform
- The total number of teaching assistants who accessed the platform
- The total number of professors who accessed the platform
- The total number of active courses on the platform
- Total resources added to courses
- Total activities added to courses
- Total posts on course forums
- Total tests / questions
- Total accessed resources
- Total accessed activities
- Course size
- The top 10 most accessed courses
- Top 10 most active professor
- Top 10 most active students

The management of the registration process, the writing, and defending of the bachelor and dissertation papers (which includes the Turnitin anti-plagiarism checking of all papers) required the release of the following reports:

- Reports of Turnitin Enrolled Users
  - Each time the page is loaded, the report generates a CSV file with all users enrolled in Turnitin activity in all academic years.
  - The file contains the following columns:
    - Academic year
    - Faculty
    - Study cycle
    - Specialization
    - Coordinating professor
    - Activity
    - Student name
    - Admitted / Rejected
- Turnitin User Works Reports
  - The report displays a hierarchical list sorted by academic years, with all the users' papers uploaded in the Turnitin activity from all the faculties. This report provides an overview of the number of papers uploaded by students and submitted for verification in Turnitin, the students' names, and the submitted papers. The information displays a tree structure format: Academic year, Faculty, Specialization.
- Turnitin Reports (are sent 5 working days before bachelor / dissertation exam to each faculty management for validate students who uploaded their graduate paper in the final version of Turnitin section):
  - Each time the page is accessed, all the papers uploaded in the final version of the Turnitin activity are saved by the location/date / local / turnitin\_files / on the server
  - The generated report contains:
    - Total papers in Turnitin
    - Total new jobs copied to location / date / local / turnitin\_files /
    - Occupied server space in GB format.

### **3 INTEGRATING MOODLE WITH THE UNIVERSITY MANAGEMENT SYSTEM**

#### **3.1 The Need for Integration**

The West University of Timișoara platform runs on Moodle version 3.11.2 (Build: 20210729), bringing many new valuable functionalities and solving security and stability issues.

From a technical perspective, the platform's components, the plugins, are all updated and compatible with the current version of Moodle. A total number of plugins: 676, and additional plugins: 240. Keeping the platform up to date is a perpetual activity that requires constant monitoring, consisting of the platform and server logs analysis and professors' and students' feedback.

The main modules available in the current structure of the platform are:

- Interface and navigation
- Authentication modules
- Functional blocks
- Evaluation and feedback modules
- Data synchronization and analysis modules

The synchronization of the standard data used determined the integration of the Moodle platform with the University Management System (UMS):

- The academic structure of the university
  - Faculties
  - Study cycle (bachelor, master, doctorate, postgraduate)
  - Form of education (frequency, DL, LFE)
  - Years of study
- Curricula on each academic structure
- Students and the current context/status in the academic structure
- Professors and their role in the current curriculum

These data are imported from UMS at the beginning of the academic year and automatically create the structure available on the Moodle platform. The course's structure categories are arborescent: Academic year, Faculty, Study cycle, Specialization, Form of education, Year of Study, Courses. The import file form for creating the structure will retrieve the data from the CSV file and generate the complete structure.

According to the context and related rights - for students and their roles in the curriculum – for teachers, automatic provision of appropriate accesses to roles is achieved based on information from UMS. Professors can use the operational Moodle instance (PROD) on which all current academic activities and processes take place and the Moodle instance created for content development and testing (DEV). The third Moodle instance created (TEST) is made to develop and test new functionalities on the platform, integrations, and new software versions.

### **3.2 Authentication using SAML (Single-Sign-On)**

Conducting digital education at quality standards in a comprehensive university with STEM fields, like business education, sociology, psychology, and vocational fields (arts, music, sports), is a real challenge, given the need to create teaching resources and activities to support a digital curriculum. The need to adapt professors' teaching strategies to manage the online educational process is another challenge. These requirements led to various technologies in the university: Google Workspace, Office 365, h5p, Cisco Webex, and the anti-plagiarism platform Turnitin, integrated with the Moodle platform.

Integrating these technologies was possible by using the Security Assertion Mark-up Language (SAML)[2] authentication system that allows Single-Sign-On (SSO), and users can log in once. The credentials confer login access to other service providers.

The credentials associated with the created institutional accounts for all professors and employees of the university respect the following structure: *firstname.lastname@e-uvt.ro*. For students, the institutional accounts respect the *firstname.lastnameeyy@e-uvt.ro* format, ensuring access to all Software as Services available in the university.

## **4 EFFICIENTLY DESIGN AND DELIVER THE ACADEMIC PROCESS**

### **4.1 Bachelor and Dissertation Papers' Management**

The LMS includes a similarity checking system for the students' papers, both bachelor/ master level from all university study programs.

At WUT, the Moodle-type e-learning platform supports the coordination of students' papers after completing their studies (bachelor and dissertation) and the final exams for university studies. The Turnitin similarity verification software integrated on the Moodle type platform ensures original students' papers.

Professors coordinate within a coordination course (page) the students' papers after completing university studies. Each professor from the level of each bachelor/master level program has such a course. Within this coordination activity, both the student and the coordinating professor have some responsibilities and obligations. Thus, the student is obliged:

- to authenticate on the UVT e-learning platform (<http://elearning.e-uvt.ro/>), using the e-uvt account;
- to submit the coordination request to the coordinating professor, using the e-learning platform (fill in the corresponding form - Figure 3, Figure 4 and Figure 5);
- To see the list of coordinators for the program, access (click on) the "Enroll" button from the appropriate bachelor/master program (Figure 2), visible on the first page after logging in to "My Page". The student will select the coordinator from the visible list after accessing the Enrollment button for the bachelor/dissertation program; if the coordinator does not exist in that list, the student will notify the coordinator regarding this issue.

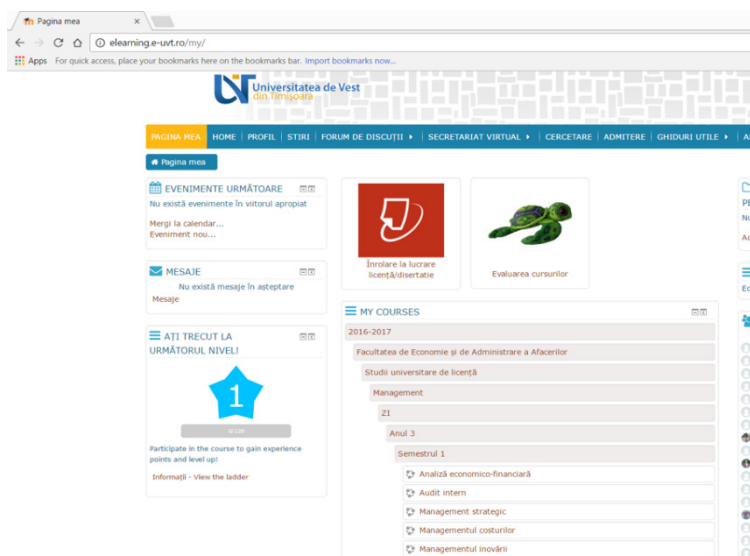


Figure 2: Initial page (dashboard), with Enroll to bachelor dissertation coordination paper button

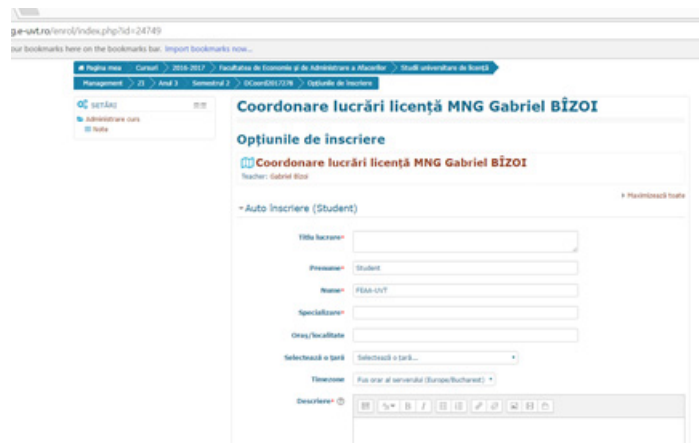


Figure 3: Coordination request form

Figure 4: Coordination request form completion

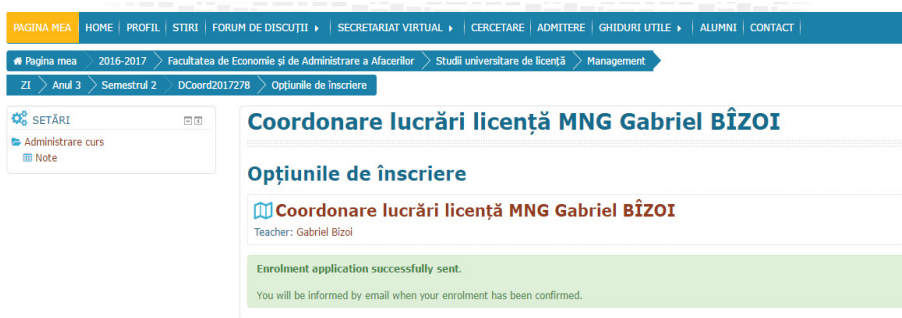


Figure 5: Confirmation of request sending to the coordinating teacher

The coordinating teacher is obliged to validate on the e-learning platform the coordination requests of the students for whom he/she gave his/her written consent due on a given date, set by the management of each faculty in the UVT. The requests can be validated as follows:

- The professor receives per mail (on the institutional address – e-uvt) the coordination request sent by the student through the e-learning platform (from the e-mail address support.platforma@e-uvt.ro - name Admin User) <
- The professor accesses the link ("Accept/Reject student enrollment") at the end of the e-mail, ticks the student's name, and chooses Confirm. At that time, the student has enrolled access to the coordination course for the bachelor/master thesis.

The coordination of the final papers after completing university studies takes place mainly on the Moodle platform. For example, the coordinating professor:

- advises the student through the e-learning platform (Figure 5) and face-to-face meetings or a videoconferencing system; scheduling and accessing video conferences is directly from the coordination page;
- ensures that the student has uploaded the paper both in the section dedicated to coordination (Figure 6) and in the section dedicated to the originality check (through a Turnitin assignment - Figure 6), the student can have access to the Similarity Report on the platform after verification of originality;

- ensures the student uploads the final paper upon approval. He/she can upload it in the final section if the content and the similarity report respect the university rules (from the pre-final section). The Turnitin add-in checks the content originality. Upload in this section is unique, as papers remain in the Turnitin repository for future papers references. The professor fills in the sub-section "Admitted / Rejected" (in fact, a Moodle Presence activity). If the professor does not check a student's "Admitted / Rejected" box, the student cannot upload the paper in the final section.
- Assess the quality of the elaborated content and the paper's originality and make observations and suggestions both through the e-learning platform and in face-to-face meetings.



Figure 6: The content of coordination of bachelor's / dissertation paper page

The flow specific to coordination of bachelor's / dissertation paper and the final university studies exams process is present in Figure 7:

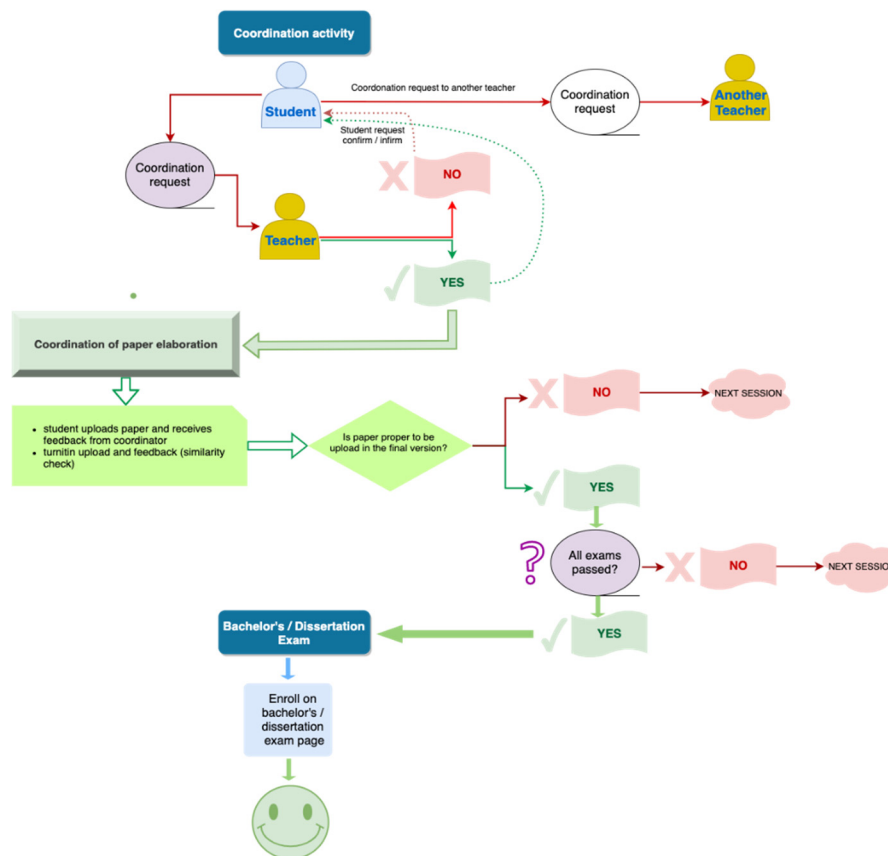


Figure 7: The flow specific to coordination of bachelor's / dissertation paper and the final university studies exams process



## 4.2 Bachelor and Dissertation Exams

To defend the undergraduate and master's degree studies thesis, we create a support page at each WUT faculty level and examination commission (a course on the Moodle type platform). On this page, we enroll the members of the examination commission, conferring them teachers' roles. The commission secretary has the Teacher-Secretary role, and the students who defend their thesis to complete university studies with the student roles. The Teacher-Secretary role has the same role as a Teacher, having, in addition, the attributes of uploading documents, like a student in an assignment.

On this page, the commission members will find in an assignment-type activity (not available to students) the candidates' papers (to evaluate), the papers' similarity reports, and the reports of the coordinating professors.

These documents are uploaded for each student by the commission secretary.

To ensure a coherent flow between the final papers (submitted in their final version within a Turnitin assignment) on the coordination page and their availability on the commission's page before their public presentation, we integrated the Google Drive facility on the Moodle platform. Thus, this flow involves the following steps:

- The coordinating professor downloads the paper and the similarity report from the final section of the coordination page in a .pdf format and saves this file, mentioning the acronym of the specialization, the student's first name, and last name.
- The professor uploads the file to Google Drive, on a particular account created at the faculty level, in a special folder shared only with the respective professor.
- The secretary transfers directly to the Moodle platform, within the assignment created for the uploading of the papers, the paper from the folder shared with the coordinating professor on the faculty gDrive (the secretary of the commission knows the credentials of the account created at the faculty level).

On the final exam page, the student will be able to upload his/her presentation and will access the videoconference for the bachelor/dissertation exam, according to an appointment also displayed on this page. The final exam page will also include the students' results for their final exam.

## 4.3 Teachers' Evaluation by Students

For the academic semester professors' evaluation by their students, there is a separate developed platform module, which allows all students to answer a questionnaire designed at the request of the Quality Management Department. The individual evaluation form is a result of the questionnaire answers associated with each professor. The questionnaire contains a set of 12 indicators for each taught subject, evaluated on a scale from 1 to 10. The evaluation form contains the average of the points received per indicator and a graph with the evolution of the general average of the teacher over the last four semesters.

The student can make a free comment to the subject of the discipline holder.

The synthesis reports on the faculties and on the entire university will be generated at the end of each academic semester by the Quality Management Department and the evaluation will be generated automatically with the follow components:

- number of evaluating students,
- valid evaluations performed (grades awarded),
- number of evaluated teachers,
- graphical representation of the average values obtained from the practice of teaching activity.

The flow specific to Teachers' Evaluation by Students process is present in Figure 8:

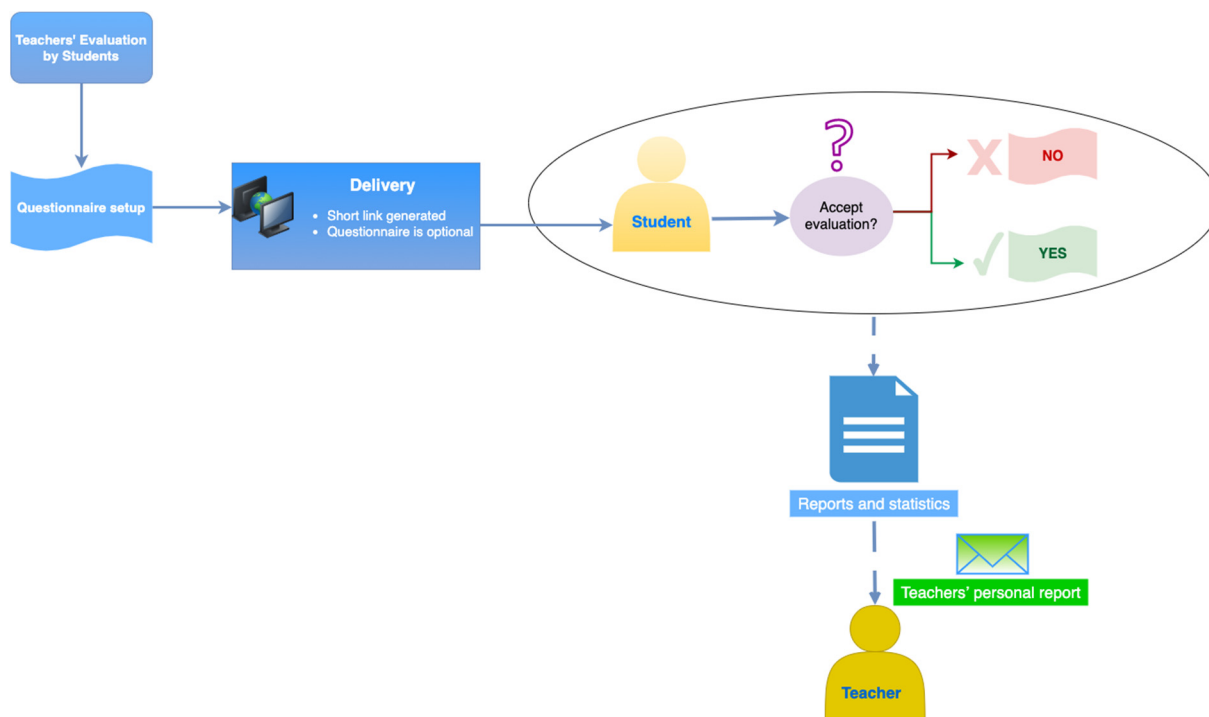


Figure 8: The flow specific to Teachers' Evaluation by Students process

## 5 CONCLUSIONS AND FUTURE DEVELOPMENT

The West University of Timișoara implemented the Moodle platform to support Distance Learning (DL) and Low-Frequency Education (LFE) from the Faculty of Economics and Business Administration teaching activities. Over time, the platform has been expanded and scaled across the university for all cycles and forms of education. Connecting the different technologies developed for education with Moodle and integrating the platform with the university students' management information system was the next step of the platform's development.

The platform's development allowed the creation of procedures and the implementation of flows for teaching activities and related processes to streamline the entire academic process. The Moodle eLearning UVT platform is developing continuously to reduce response time and system security with an ever-growing number of users. It adds new functionalities to allow students to connect with university partners from the socio-economic environment (internships, topics for undergraduate and dissertation papers, job offers, etc.).

The platform will provide a consistent presentation medium for analytics and reporting. The platform will need to include a detailed review of the information needed at the university level and how it can be shared and accessed as a single point of trust. Therefore, the platform will undoubtedly remain fundamental at the level of the West University of Timișoara's future digitization strategy.

## References

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