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Analysis of selected e-learning platforms and creation of guidelines

Based on Aula Virtual (Blackboard), Wikamp (Moodle) and Federica.eu (proprietary MOOC platform)

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1 Introduction

The main objective of this IO is the analysis of the selected e-learning platforms, where the courses will be uploaded, in order to facilitate guidelines for connection and the creation of a user guide for universities indicating how to upload the courses. This analysis will consist of a study of usage, supported evaluation methods, teaching methodology, etc. The e-learning platforms selected by the partners are the ones used in the respective universities and their input has been provided in order to analyse the platform. These platforms are Blackboard-based Aula Virtual from the University of Alcalá, Moodle-based Wikamp from the Lodz University of Technology and a proprietary Massive Online Open Course (MOOC) platform Federica Weblearning - Federica.eu. The main objective of this action is, therefore, to analyse the features and applicability of the specific e-learning platforms which will be operating in ErasmusX.

This study will facilitate the creation of guidelines for universities on how to upload the online courses in the common platform, as detailed in IO1, and will allow each participating university to develop their own user guide for teachers willing to learn how to create new online courses.

2 Descriptions

2.1 Federica

University of Napoli Federico II established a web learning center in 2006.
It is accessible at https://federica.eu/ (for English version https://federica.eu/?lang=en).

Figure 1. Federica Weblearning Landing page

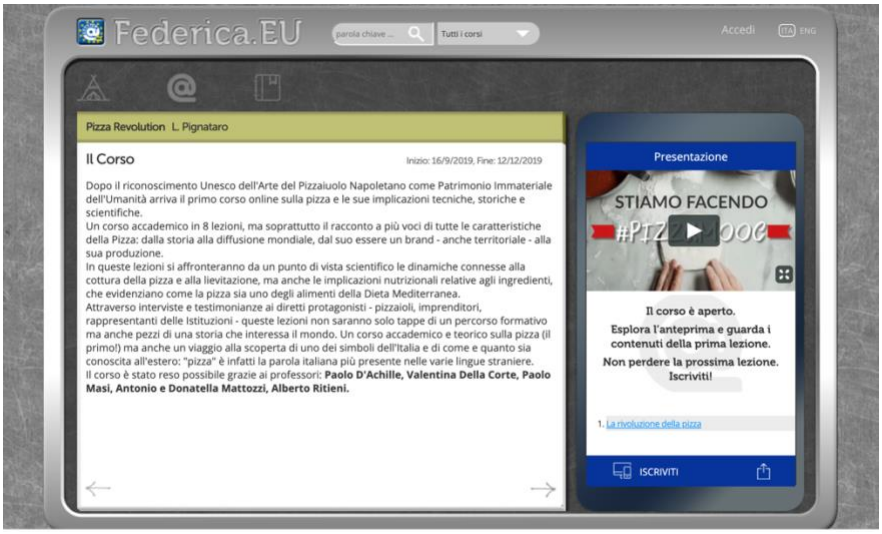

Figure 2 A Course landing page, accessible without registration

The web-learning center is named "Federica Web-learning" and is the Centre for Multimedia Distance Learning of the University of Naples Federico II. It is the largest worldwide provider of open access multimedia courses in Italian. Federica Weblearning has developed an infrastructure for free access to the knowledge fully devoted to innovation and experimentation of multimedia distance education, with intense international attitude. "Federica Web-learning" success is confirmed by the numbers reached in the first seven years on the platform www.federica.unina.it: 300 blended courses, 5.000 lessons, an increasing trend of more than 5 million of accesses per year from 2016 onwards. Today Federica is the largest single university platform in Europe, with 120 MOOCs published on the Federica.eu portal since 2015, which cover a wide range of academic disciplines. With Federica Weblearning, the University Federico II has led EMMA (European Multiple MOOC Aggregator), a project funded by the 7th Framework Programme with a network of 12 universities, research centers and companies from 8 European countries operating in the digital education.

2.2 Aula Virtual

University of Alcalá (UAH) has been using AulaVirtual for almost 10 years. AulaVirtual stands for “Virtual Classroom” in Spanish and it is an implementation of online course platform based primarily in Blackboard: https://blackboard.com

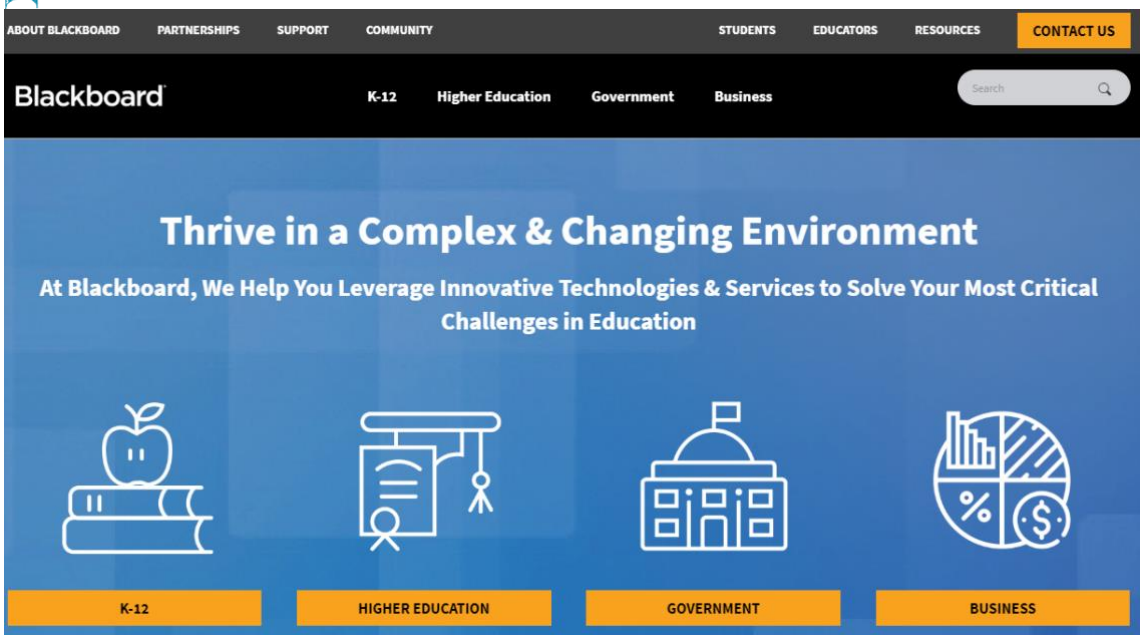

Figure 3 Official website of Blackboard

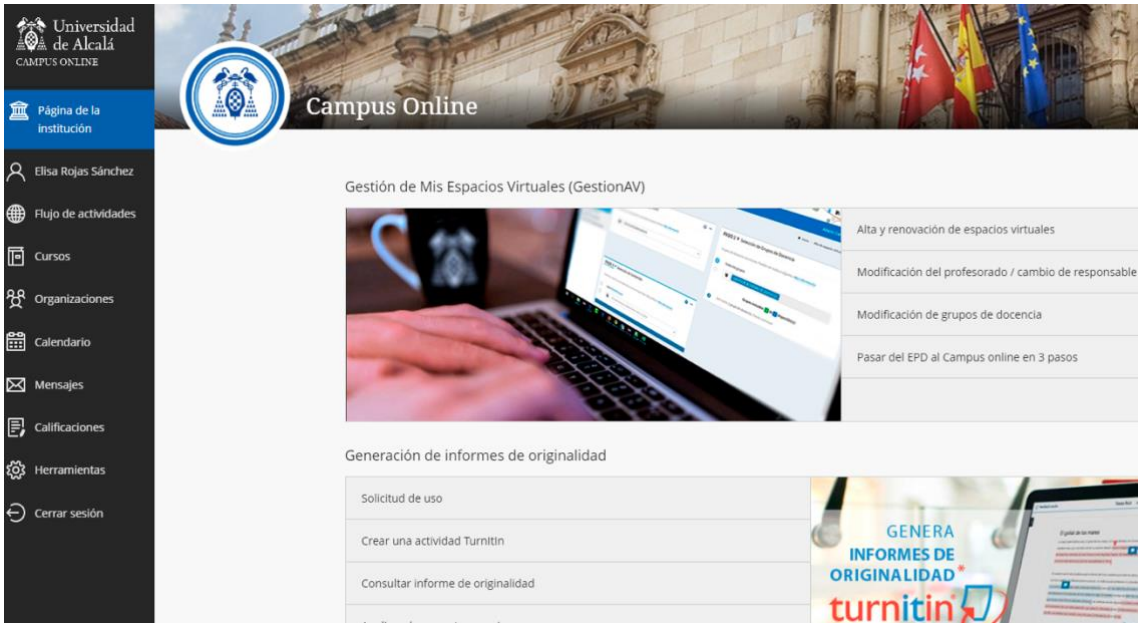

Figure 4 General overview of the platform

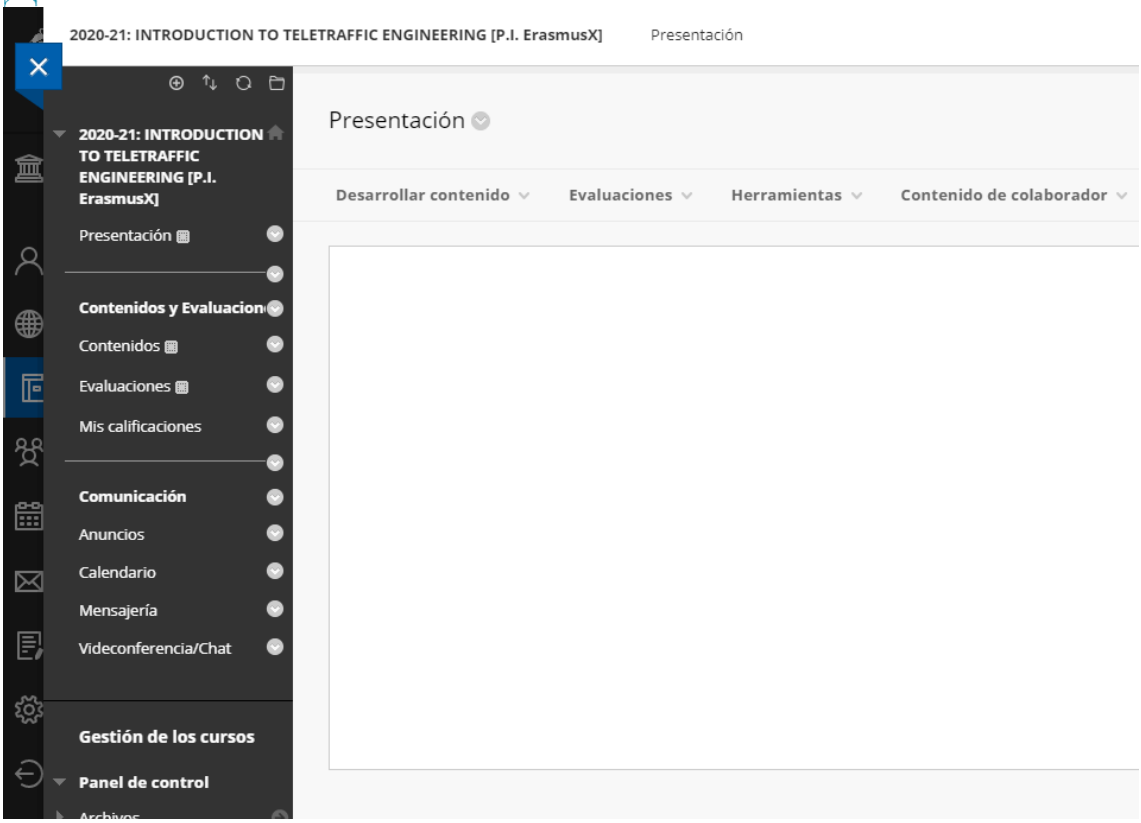

Figure 5 Specific view of one of the courses

It could be said that Blackboard is particularly popular in North America, while Moodle is mostly leveraged in Europe. In fact, most universities in Spain use Moodle instead of Blackboard, so UAH is an exception.

Courses in AulaVirtual are only offered to students enrolled in the University, either standard or Erasmus students. All courses have one dedicated space in AulaVirtual to host online content. Though most of them are only created to support the physical classrooms, UAH also offers exclusively online courses, mainly for master degrees and specialization courses.

Quick references:

1. General manual of Blackboard: Manual Web de Blackboard (Spanish)
2. Specific manual of AulaVirtual, as an implementation of Blackboard in UAH: Ayuda de profesores de la UAH (videotutorial and other resources in Spanish)
3. Official Blackboard guide: Ayuda oficial Blackboard para el profesor (any language, although the most complete version is in English).

2.3 WIKAMP

WIKAMP platform is based on open-source Moodle LMS (Learning Management System). It is different from Open edX for example, but Moodle may be found in numerous places. For this reason, there is both official documentation on moodle.org website and materials on-line like YouTube videos regarding specific aspects of course organization.

There are official training courses for TUL teachers, certified by TUL E-Learning Centre. Such certificates are valid only for specific amount of time, and require recertification

after for example two or three years. After being certified teachers gain administrative access to their courses and have full control over their contents.
WIKAMP is the e-learning platform of Lodz University of Technology, Poland (TUL). The name stands for "Virtual Campus" in Polish. WIKAMP is based on open-source Moodle, with additional plugins and customizations. Starting address of the platform is: https://edu.p.lodz.pl?lang=en

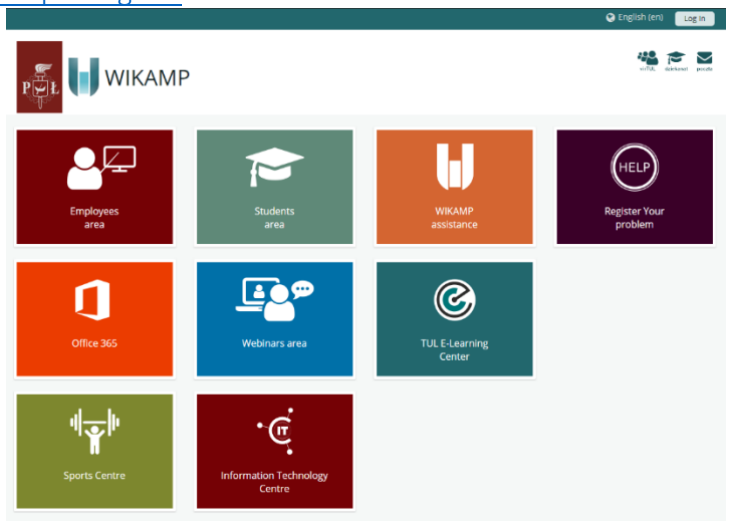

Figure 6 Wikamp landing page

WIKAMP started over 10 years ago at Faculty of Technical Physics, Applied Mathematics and Computer Science, then expanded to university-wide service. Nowadays it has over 18,000 users: teachers and students from Poland, Europe (Erasmus), also India, China, etc. Over 600 teachers are trained to use this platform (and this number is growing). Platform is also used for university-wide information portal, with important documents (e.g. internal rules of law), searchable forums with notifications for all employees and students, as well as internally developed plugins for administrative purposes.
This can be found at: https://adm.edu.p.lodz.pl?lang=en

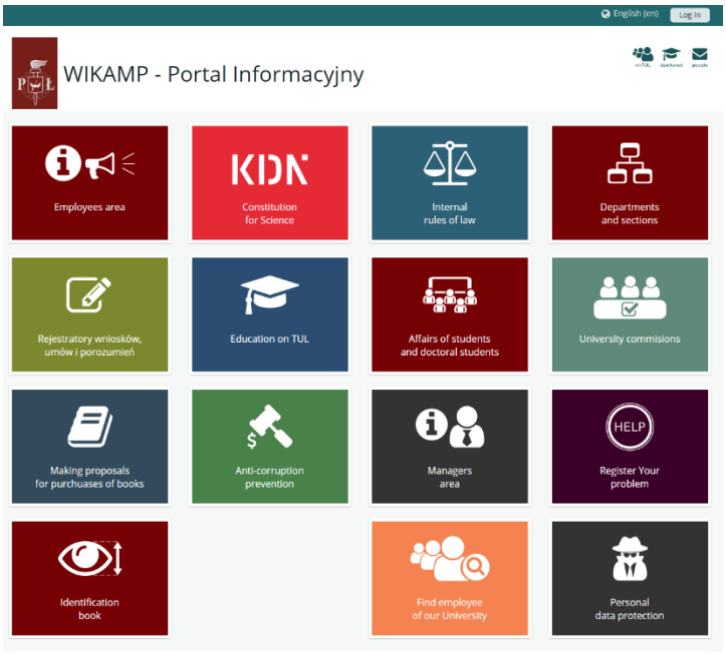

Figure 7 Wikamp information portal

3 Instructional Design

3.1 The design of courses on Federica

Federica.EU, differently from other LMS (Learning Management Systems), such as Moodle or Open edX, is a proprietary platform that is not supposed to be used without a technical help and supervision. For this reason, no technical documentation is available.

The Teacher is guided through the process of organizing and producing the lectures by two course managers that help with both the technical production process, and the lectures planning process. The help is provided on every aspect of the course: video production conducted either in the internal video recording room or in external; adding slides to the lectures; quiz and tests productions.

The joint action of Teacher and online course producer experts guarantees a very high quality of the resulting lectures. It also guarantees a large degree of uniformity among the online courses provided by Federica. On the other side, the production process is very expensive as it requires the continuous work of at least three highly skilled people.

To give an idea of the amount of technical effort required to the Teacher, slides, notes, quiz, and links to external material, are usually provided in plain word or PowerPoint format, leaving to the technical staff the effort to convert and put them online. The possible optimization of the images to be used and uploaded is also in charge to the team of course managers. The video production process (video and

sound recording, video editing, and video uploading) is also devoted to the technical staff of Federica.
The usual, and suggested, format for a course in Federica is the following.

- Course overview
- Teacher(s) biography
- Course trailer: a synthetic overview of the topics
- Lectures (on average 10 to 12 lectures for each course)
- Every lecture is divided into 3 teaching units:
    - Every teaching unit starts with a video (6-10 minutes). Every lecture is then composed by three videos.
    - Every teaching unit is composed by 7 to 10 slides with text, images, and external links. In total a lecture is composed by 25 to 30 slides.
- Every lecture can finish with a self-evaluation quiz.

In summary, excluding the intro and teacher biography, a course is composed by:

- 1 video trailer (2-3 minutes)
- 10-12 lectures
- 30-36 video (6-10 minutes each)
- 500-600 textual slides
- 250-300 images
- 30-60 links to external sources/documents for in depth studies
- 10-12 self-evaluation quizzes.

The above indicated structure is however flexible. Some of the courses have one video per lecture, and there are 'light courses' with one video per lecture.

3.2 Course design in AulaVirtual

There is no specific format for courses in AulaVirtual, but most common courses are based on course material based on *.pdf or *.pptx documents.

Additionally, many courses implement evaluations to track the progress of students and these also count as a percentage of the final grade. AulaVirtual allows random generator of assignments and questions based on templates, so that students cannot copy the solutions from their classmates.

However, full virtual courses are not common in UAH and not many implement material in alternative forms, such as video. This is mainly due to their nature of supporting the traditional classes and not providing a whole course all alone. In any case, UAH has a technological centre to support multimedia (including professional video recording and editing) and there is an increasing support for the virtualization of courses in the long-term.

3.3 Course design in WIKAMP

There is a support course for teachers, in form of FAQ section with PDF tutorials. Teachers have also access to WIKAMP HelpDesk, where they are assisted by TUL CEL employees, trainers and administrators if necessary.

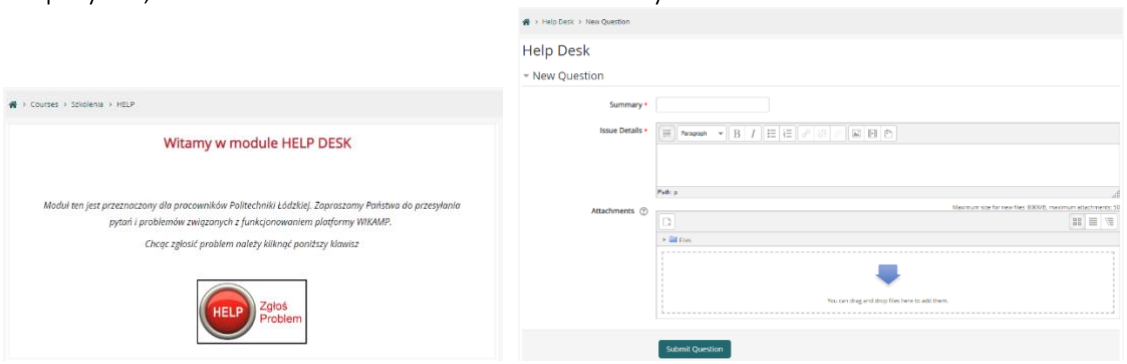

Figure 8 Wikamp helpdesk

1.1.1 Course types

Creation of on-line courses and types of e-learning used in the course depend on what the teacher intends to use. It may be as simple as on-line presentation of grades that fulfills requirements of European GDPR (RODO in Poland). It may also be distribution of learning materials to students, gathering of students' work in electronic form, blended e-learning, and supervised e-learning.

1.1.2 Videos

One thing to note here is that creation of high-quality video is expensive. TUL has separate Centre for Multimedia, that employ specialists working with professional grade cameras, lighting and sound, also with lectors and video production editors. There is close cooperation ongoing between TUL CEL and TUL CM units as well.

1.1.3 Webinar availability and automation

Teachers may also undergo training for using TUL integration with webinar platform. This has a form of Webinar booking calendar plugin integrated with WIKAMP.

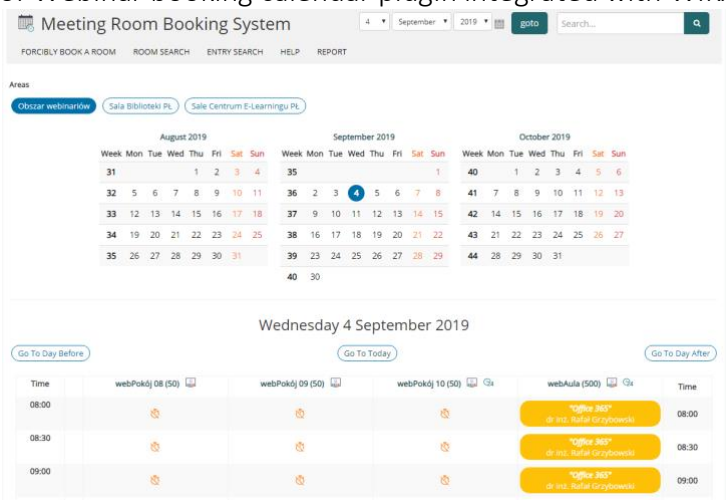

Figure 9 Webinar booking system

Above is the day view in reservation system, below are details of a single reservation.

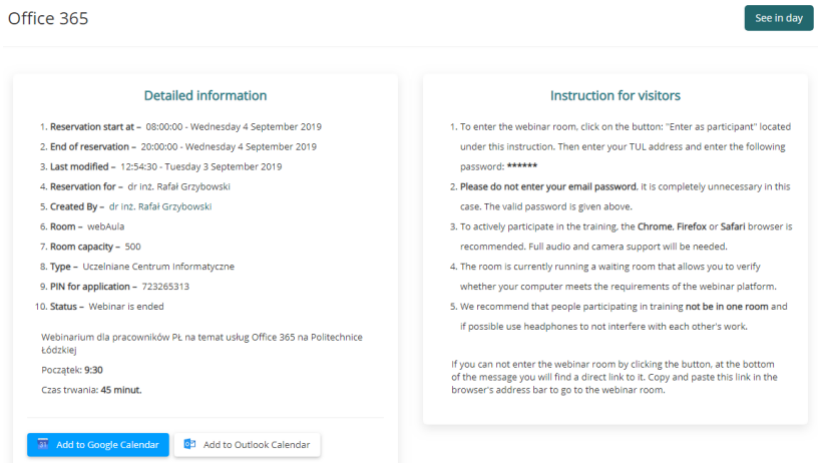

Figure 10 Webinar confirmation with details

This provides support for extensive e-mail notifications, separation for visitor and presenter roles, automation necessary for integration with conferencing system, summaries, download of webinar recordings, etc.

3.4 Comparison of the platforms

This section is devoted to the analysis of the platforms according to their affordance (features and tools), types of assessment and assigments, instructional models and modes of delivery, including teaching and training support provided. The table below (table 1) compares and analyses the capabilities of the platform but also contextualized in instructional strategies used in respective universities and the provided support.

Table 1 Platform comparison

	Features/tools								*Assignments /Assessment*		*Instructional models, support and modes of delivery*		
Platform	Trailer	Video	Webinar	Text integrated	File types:.pdf .ppt etc	Forum	Add. Material (links, other resources)	Pedagogical tools	Automated quizzes	Assignments	Modes (instructional design)	Delivery	Teacher training/Support /training
Federica	x	x		x			x	Gamification planned	x		Self-directed, blended, aligned with curriculum	asynchronous	x
Aula virtual		x	X (integrated)	x	x	x	x	x	x	x	Complementary to curriculum	Asynchronous/asynchronous	x
WIKAMP		x	X (integrated)	HTML page resource, lesson, book, wiki	x	inside any course	x	Interactive content H5P, gamification (experimental)	x	x	Blended e-learning, and supervised e-learning, repository	Synchronous/asynchronous	x

4 Workflow Management

4.1 Federica

Workflow management in Federica MOOC production is very well defined and managed through the whole Federica WebLearning team in collaboration with the lecturers. The process is described in steps and roles: conceptualization, meeting the instructor, lesson development, video production, release and finally, feedback for next versions. Overall, 21 roles and professionals are involved in the production process.

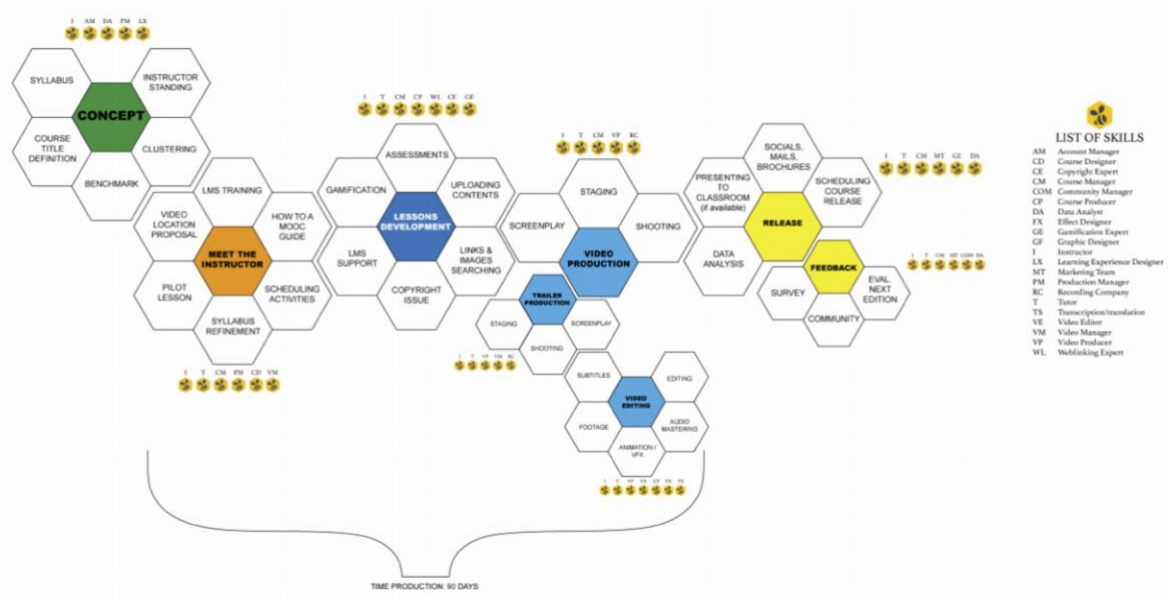

Figure Federica WebLearning Workflow[1]

4.2 Aula Virtual

AulaVirtual is supported by a specific unit/team in UAH to solve any issue (technical or administrative). AulaVirtual is also supported by a general guide for the UAH platform and all the manuals provided by Blackboard, as presented in the quick references in Section 1.

Additionally, the AulaVirtual team periodically prepares courses to teach the professor how to leverage the platform and to show the different utilities. This team is also in charge of regular updates of the platform, following the requests of its users (either students or teachers). For example, one update of this academic year 2018/2019 was the integration of a tool called “GestionAV” (which stands for “Management of AulaVirtual”) for professors. This tool allows professors to renew the virtual spaces for their courses, enroll students or include other teachers just by indicating their IDs (as we mentioned

1 De Notaris, D. (2019, May). Reskilling Higher Education Professionals. In European MOOCs Stakeholders Summit (pp. 146-155). Springer, Cham.

earlier, this ID is unique for the whole University tools), which previously was only managed by the AulaVirtual team.

The next figure shows a summarized view of the Teacher dashboard. Basically, it contains the profile, notifications, statistics, etc. Also, the Teacher can enable or disable the edition mode (to avoid modifying parts of the course by mistake), and there is an option to convert the "Teacher view" into a "Preliminary Student view", to acknowledge how a Student will see the online course (which will differ from the Teacher view) and also, for example, to check examinations and online tests.

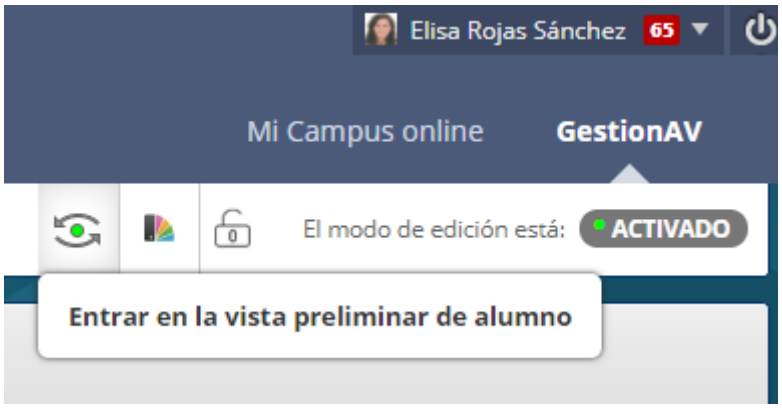

Figure 11 Quick view of the Teacher dashboard, clicking in the "preliminary student view" option

AulaVirtual is not planned to be used *à la* MOOC. Therefore, material should not be necessarily videos. However, UAH provides a technical staff team for video creation to enhance the course experience. Any Teacher can work together with this video production team to produce high quality video lectures, which usually require slides, notes, and links to external material, leaving to the technical staff the effort to edit them.

4.3 WIKAMP

Courses on WIKAMP are closely related to the study programs offered by TUL, see: https://programy.p.lodz.pl/ectslabel-web/ (Polish) and https://programy.p.lodz.pl/ectslabel-web/?s=glowna&l=en (English).

Teachers request to create course on one of the portals, students may then enrol in such courses (details provided in next chapter). Courses have allocated ECTS points, according to the study program. Most of the courses are in Polish, about 10% of them are in English. This is closely related to the curriculum of IFE (International Faculty of Engineering), where most of Erasmus students are enrolled to. As of October 2019, there were over 3900 active courses on all WIKAMP platforms. There are official training courses for TUL teachers, certified by TUL E-Learning Centre. Such certificates are valid only for specific amount of time, and require recertification after for example two or three years. After being certified teachers gain administrative access to their courses and have full control over their contents.

5 Course Versioning & Editing

5.1 Federica

Course versioning and editing in Federica is ensured by the Federica weblearning team in collaboration with lecturers and embedded in the workflow for future versions and agreed with lectures.

5.2 Aula Virtual

In the case of AulaVirtual (based on Blackboard), the first time a course is created it has to be requested to the managers, who will ask about its duration, year, etc. and a responsible person/professor. Once that is done, course versioning is automatically handled by the responsible person, in charge of renewing the site every year (there is a reminder sent at the end of the course), which can be renewed based on a previous course or a different one or completely blank. This renewal is limited to the academic definition of degrees, so if the course is out of the "official catalogue", it will not be automatic (and will be supervised by the central managers). The responsible person can also add other professors, change the course main features, etc.

Regarding edition, any professor can edit the course content. Edition is enabled by default for professors (enable visibility, features, content, etc.). There is a feature for professors to create a "fake student profile", to check how the students see the course content, and even test the online tests, etc.

5.3 WIKAMP

After a course is created "editing teachers" are assigned, rarely "course authors" (that are able to edit contents, but are unable to grade students). Editors are responsible for course content.

There is automatic backup mechanism of courses. There is no explicit support for course versioning, however there are cases when the following procedure is used:

- Backup of current version of a course is created
- Current course is made invisible to students
- New course is created based on previous backup, with no participants - this essentially creates a new version of the course that can be further edited

Table 2 Comparison of several important considerations

Platform/considerations	*Federica*	*Aula Virtual*	*Wikamp*
Social Considerations	Not in the platform, video driven MOOCs	It does have forums, internal messaging/chats, videoconferences, peer review, etc.	forums, chat, peer review etc.
Third-party content	Not allowed directly, can be linked as add. material	HTML embedding is allowed. Allows plugins via LTI, more info here: https://help.blackboard.com/Learn/Instructor/Course_Content/Create_Content/Add_Content_From_External_Sources	References of web pages, links to publicly available resources. However, there are some general rules of permissible public use apply. And if followed (for example: getting a permission of material owner before publication of a course) that is also acceptable. This also includes materials that fall under Creative Commons license
Automated profile loading	New registrations	Possible. linked to the University profile.	Erasmus students that come to Lodz, Poland are supported by Students Office. Such students get their student IDs, passwords, and are granted regular access to our electronic systems like all TUL students.
Quality Assurance	Quality assurance managed by the continuous quality checks at all stages of course production	This is managed by the central managers and, particularly by the teaching section / faculty directives. They have a possibility to do random checks and professors are aware of it, but that's it. I'd say this is not something that depends on the platform itself, but on the University directives	Team from E-Learning Centre (CEL) reviews any courses that are to be publicly visible. Otherwise teachers that are creators/editors in courses are responsible for course content. Teachers that use WIKAMP are first certified, and have support from CEL for technical questions regarding courses and activities. There is a review process, but not on a regular basis for all courses that are on WIKAMP platforms.
Ability to link with or develop database-driven Interactive websites	To some extent, case by case basis	Tests can be generated in a random way based on a database, but that's it.	case-by-case basis, due to time and effort considerations
Standard (SCORM/AICCS)	SCORM, xAPI	SCORM (up to 4th Edition), xAPI, IMS, NLN content	SCORM, xAPI, IMLS, AICC

6 Registration and access

6.1 Federica

The registration procedure requires to provide quite basic information and sends a registration link to the provided address (beware the spam folder).
A screenshot of the registration page is given below.

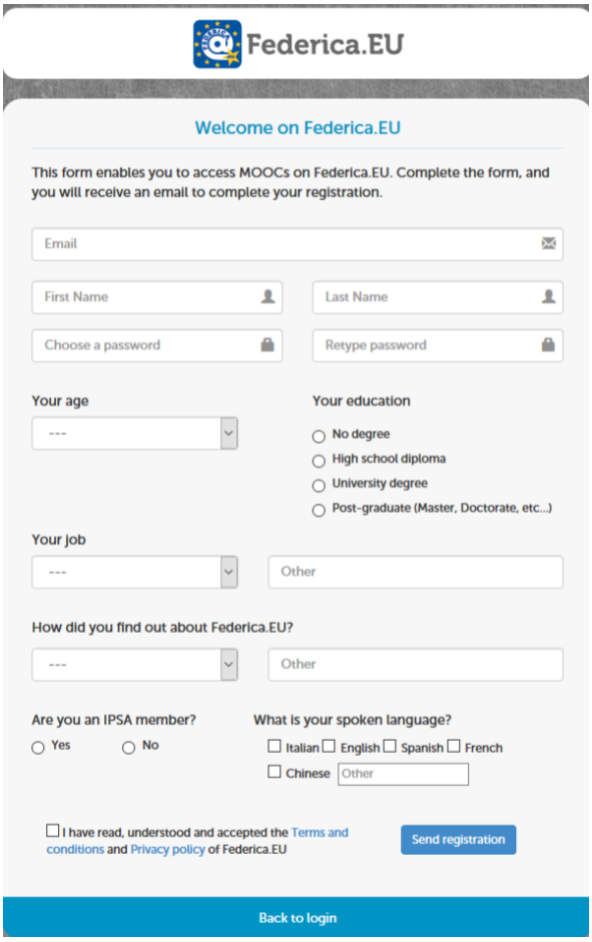

Figure 12 registration form

Enrolling is straightforward and does not require an activation email.

6.2 AulaVirtual

Students cannot register to AulaVirtual by themselves. Accounts are created by a specific AulaVirtual unit in UAH and are only provided after enrolment. In this way, accounts are controlled and unique per student (as per professor). These accounts are global and common for any other tool from UAH (for example, University email or MiPortal, a platform that provides a general overview of the student progress, including paid fees or

passed courses). In fact, accounts are linked and integrated with a global Outlook365 profile from Microsoft.

In the case of enrolment, this is done automatically after the enrolment is done. Students are assigned to the enrolled courses and if the course coordinator creates a "space" in AulaVirtual for that course, then it will automatically appear to all students enrolled in the course. Additionally, the Teacher profile can also enrol and remove students to their owned courses.

The process is the same in the case of Erasmus+ students. Once the Learning Agreement is approved, the Erasmus coordinator sends it to the AulaVirtual unit, and they create a unique account for these students and enrol them in the requested courses.

6.3 Wikamp Federated login

To access WIKAMP, a user selects access type (left). One may login as regular user, student or professor, or use guest access with limited possibilities. In the latter case user is prompted for credentials using CAS / Central Authorization Service (right).

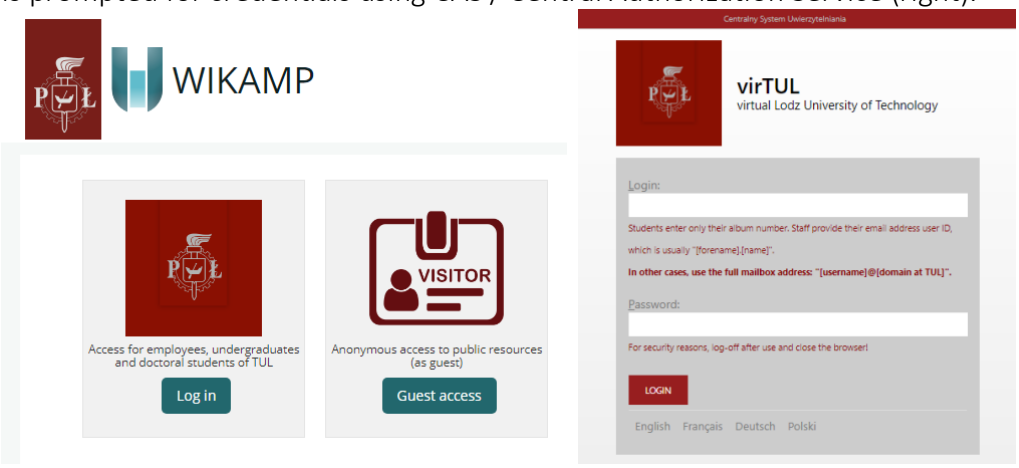

Figure 13 Wikamp login

After logging in, users may switch from home portal to others and come back to home portal, using "WIKAMP Platforms" menu:

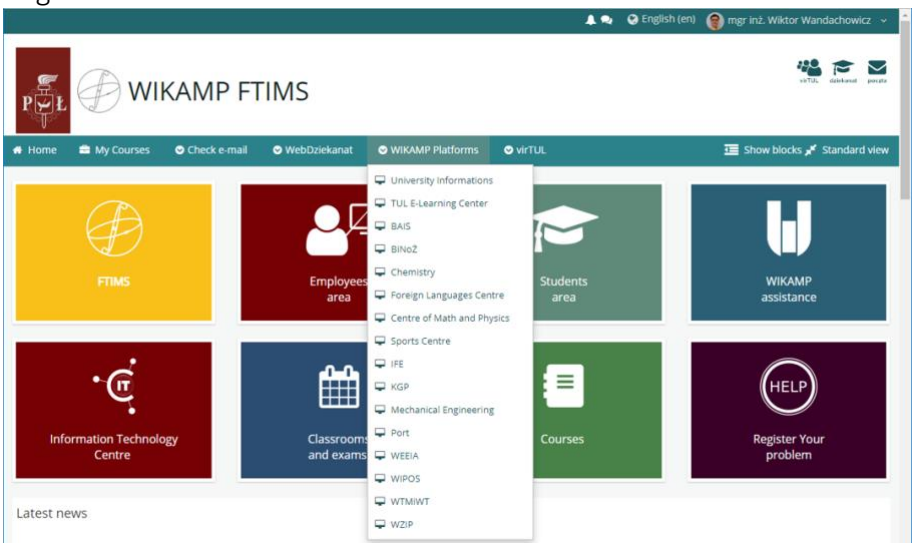

Figure 14 Wikamp platforms

Since September 2019 students and employees of TUL after single-sign-on process now have access to Office 365 applications including: Outlook, Calendar, Word, Excel, PowerPoint, Teams, OneDrive, etc.
Further integration of Moodle / WIKAMP with Office 365 is currently undergoing.

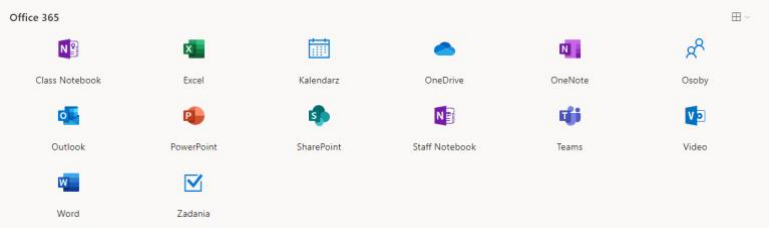

Figure 15 Integration with Office 365

7 Conclusions

Overall, we have three different platforms, used for different purposes: self-directed Massive Online Open Courses, fully aligned with curriculum (Federica), Complementary to curriculum (Aula Virtual) and Blended Learning, supervised learning (WIKAMP). At the same time, these platforms are also different when it comes to their features and capabilities (analysed in the chapter 3.4). For this, it is advisable to use each platform in the consortium according to their affordances and instructional models.

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