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A NEW TOOL FOR COURSE DESCRIPTION USABLE IN E-LEARNING PLATFORMS DEVELOPING

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Abstract: *Setting up an academic programme is a complex task that must consider many data that obey specific rules, establish certain relationships between the elements involved, and respect a well-defined hierarchy. The central object of an academic programme is the course that plays the role of a brick in a building: it must fit perfectly between its neighbours that form a layer, which together with the lower and upper layers, must give the shape of a unitary system. The course, being the elementary unit of the academic programme, must be very accurately defined by its type, category, level, number and type of activities, number of hours allocated to each of it, number of credits, intended learning outcomes, and others. All these must give a full and balanced description of the course that depends on various data collected from different sources. The present paper proposes a new original tool, which works as a template file that aids the course designer in providing a complete and coherent description of a course, respecting some previously defined conditions. The tool's novelty consists of a table-shaped document that combines selected-from-a-list, calculated, open inputs, and verification fields that signalize any error occurrence and provide hints for their correction in the process of course description. Using this tool, the course designer can easily provide an error-free course description, combining data collected from interconnected tables and adding specific pieces of information, so that it can be later used in e-learning platforms via import/export files.*

Key words: *e-learning platform; course description; software tool; common aggregation hierarchy code; learning outcomes.*

1. INTRODUCTION

During the last years, e-learning has been expanding and winning over many areas of knowledge. The need for e-learning has become more evident during the COVID-19 pandemic and the demand of online interactive learning platforms has increased rapidly. The potential of these new technologies will change the way one used to teach and learn, and the educators must adapt quickly to these methods.

In the field of Science, Technology, Engineering and Mathematics (STEM) education the critical issues are [1]: the need of a much higher volume of technical information allowable for students in a digital format, the need of new skills for a relevant use of Information and Communication Technology (ICT) both for teachers and students and the need of developing virtual laboratories for practical activities.

It is now clear that for a higher rate of success of e-learning, it is necessary to develop online platforms, generally referred to as Learning Management Systems (LMS). These platforms must be used as an additional tool to the traditional, physical classrooms, creating Learning Spaces [2]. This concept of education integrates the physical, traditional space of teaching and learning with the virtual one, the online platform (LMS), as a complex tool for knowledge transfer. A recent study revealed that the interest in e-learning has increased in the late years, and concepts such as collaborative learning, blended learning, and online learning are very relevant [3]. The study also identifies some challenges faced by the universities in using e-learning platforms: lack of proper infrastructure, low-quality internet networks,

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lack of digital skills for teachers, outdated content of the courses, and out-of-sync curricula with the actual and future job skills of the graduates. An e-learning platform is an interface between students, teachers, and administrators delivering and receiving a certain set of learning outcomes. Such platforms have become integral to modern education, offering diverse functionalities to facilitate learning across the globe. These platforms provide an environment with a common objective of learning. The evolution of e-learning platforms has been driven by technological advancements and the need for flexible, accessible education solutions. Recent studies have analysed the most commonly used e-learning platforms that are available worldwide today [4-6]. A comparison of the most widely used platforms was made [4], considering features like ease of setup, diversity of content, customization, multi-language support, and management issues. The concept of Personal Learning Environment (PLE) has been mentioned and analysed in terms of individual personalization for each student [6].

The most popular e-learning platforms across the world are Blackboard, Canvas, IL-IAS, Google Classroom, Moodle, and Sakai [4]. Moodle and Blackboard offer extensive and scalable customization while Sakai has fewer possibilities, and ILIAS has no customization options. Some of the platforms offer multi-language support, like Moodle with 73 language options. All the platforms have an easy method for uploading course materials. Moodle and Blackboard offer advanced tools for video conferencing, forums and chats, and various assessment features. Moodle stands as an acronym for Modular Object-Oriented Dynamic Learning Environment and is a widely used open-source LMS [7], designed to create customizable, scalable, and feature-rich online learning platforms. It supports course creation, interactive activities, assessment tools, and collaborative tools like forums and videoconferencing. Its flexibility, scalability, and extensive plugin ecosystem make it ideal for diverse eLearning needs. Since 2002, when it was released, Moodle has spread across the world and had an increasing development, today being one of the most used LMS platforms, mainly in STEM universities. Recent research has analyzed the advantages and the weaknesses of Moodle [8], outlining the challenges and future trends. A very comprehensive study has identified over 300 articles in the field in the last decade and objectively selected over 150 for review [8]. Some of the most discussed themes were the platform features, curriculum development, student assessment, and success indicators. An important conclusion of the study is that Moodle enables the creativity of teachers to develop course-specific materials for students. Moodle is also time-efficient due to the various types of randomly generated tests, single and multi-choice questions, and automatic summative and formative feedback. Moodle can easily embed external tools and educational resources. However, the study also revealed some gaps and drawbacks. One is related to the teacher-centered courses principle, instead of a study program-centered approach. Each course in a curriculum must fulfil a set of Learning Outcomes (LOs), which correspond to a certain occupation according to ESCO [9]. Besides that, a course has a structure with many types of data like name, level, status, teacher, availability, allocated time and number of credits, prerequisites, content structure, assessment structure, etc. All these data must be accurate, according to the curriculum. To achieve this purpose, a course description tool is very necessary. The available literature review did not identify clear conclusions about some dedicated tools that can automate and verify the accuracy of data when a new course is introduced on an LMS platform.

Some studies [10-14] propose various types of tools that can automate the process of a new course description and creation. All of these emphasize the lack of a consistent standardized approach for retrieving course-related information. In [10] the main conclusion is that users are sometimes not very familiar with the software tool, and errors may occur in the creation of the course. The tools proposed in [11-12] use XML-based or IMS-LD formats, which are compatible with several LMS platforms. However, these formats are rather difficult to use by the educators, and hence have limited usage. Also, the availability of the tools in different universities and countries is often poor, because of differences in courses and curricula approach.

Other studies [13-14] have proposed tools that include course planning and checking. These tools are more complex, and their use by common teachers may be difficult.

With the rapid development of Artificial Intelligence (AI) in the last years, some research has investigated the utility of AI-based software for the creation of a fully online course for higher education [15]. The main conclusion of the study was that AI can be a powerful tool for educators, but it is acknowledged that human expertise will be needed for the whole management of the course content. No matter the platform, all of them grant the course description an important role. It aims to give a brief but clear description of how the course is integrated into a study program, the workload, its contents, the assessments, and many others. A research [17] claims that a course description that includes "time planning, learning outcomes, and other resources such as glossaries or concept maps and schemes" can be considered an extended one without linking the course to a study program. In [18], it is agreed that the course description format must comply with the specific rules in each university, so it is almost impossible to define some standards on this issue. However, to keep the consistency of the data provided by the course description with the context, some means to check it are needed. Unfortunately, the study does not point out such means. An attempt to standardize the course description is presented in [19], but it is designed to describe the course only in the context of the ECTS system, as a tool for students to find courses that fit their needs in terms of academic credits. To conclude, one may appreciate that by "course description", some authors mean "a whole study program". On the other hand, some other scholars refer to "course description" as to a subject but do not integrate it into an academic programme.

One of the first approach of the course description [20] considered this concept rather as a means to inform potential students on the contents of the subject, and eventually to guide them in choosing it for study. One can consider this approach as an old-fashioned one, which does not reflect the nowadays vision on the course description. Apart from this, the current research viewed the course description as a course and study program management tool. It gives a bird's eye view of the subject as part of an academic programme, and considers its various aspects, such as student workload, credits, activities, ILOs, and assessment. Furthermore, the different aspects in discussion are connected through logical and quantitative links. Contrary to the initial approach, the present work proposes a tool that bridges the gap identified in the literature. This tool considers the course as part of the academic programme to which it belongs. It aims to integrate the course description into the context by gathering some pieces of information from related data files. Furthermore, the tool is equipped with data checking mechanisms that prevent the user from making some calculation errors.

The new tool presented in the article proposes has certain pieces of novelty. They mainly consist of using a customizable course description template based on user needs. It integrates general data about the subject, student workload and credits, correspondence between programme objectives and Intended Learning Outcomes (ILOs), correspondence between subjects' contents and ILOs, and assessment activities. To check the consistency of data, a verification mechanism is implemented using formulas and a safe mechanism to input data using a selection list. Several types of cells are used in the spreadsheet. Their meaning is emphasized by the background color. By using the proposed tool, the course descriptions benefit from a unitary appearance and the risk of error occurrence is minimised.

The article is further organized as follows: Section 2 presents the context of the problem and introduces the proposed tool: a template file used to elaborate the course description and the data it handles. Section 3 presents the output of the research using an example of using the tool and discusses it, while Section 4 presents the conclusion drawn and foresees the future directions for the development of the research.

2. MATERIALS AND METHODS

Describing a course in the context of the academic programme it serves/belongs to is a

complex task because it must put together, obeying certain relationships and rules, data collected from different sources, with particular pieces of information that form its specific content.

The course description displays several sections that deal with specific aspects. Between the different sections of the course, specific relationships are established, and the content of some of the sections is strictly related to the academic programme to which it belongs. The entire course description is a worksheet with links to other files. Also, between the different sections of the course description, there are established connections by different types of cells.

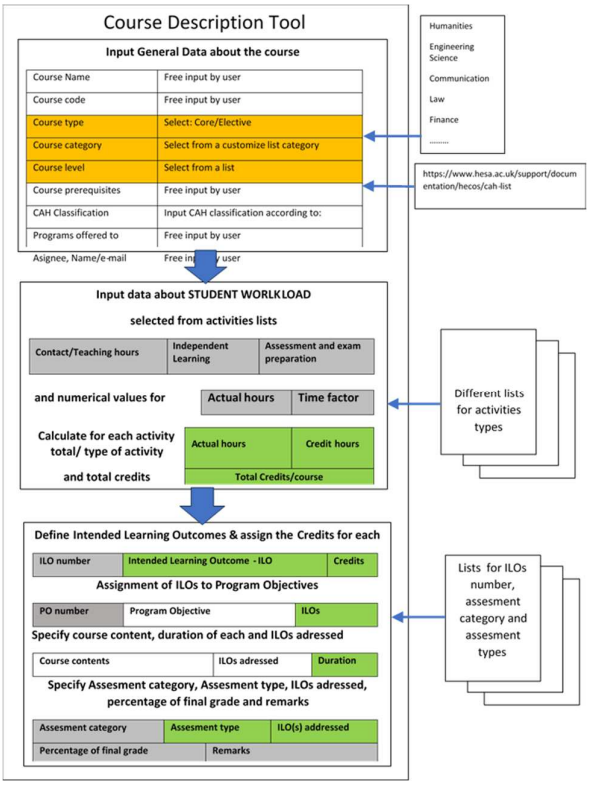

Fig. 1. The block scheme of the Course description tool

Figure 1 presents the block scheme of the course description tool. There is shown the way to collect data from different sources. The tool is designed in a spreadsheet. The content of the selection lists is built in a second spreadsheet of the workbook. The elements of the selection list are taken from another table, i. e. the course mapping. The content of the selection list is fully customizable. Creating the selection lists is a task performed by the designer of the course description tool, not by the users. Further details about the selection lists will be provided in the sub-section dedicated to this element.

The various sections of the tool are traversed successively. In the sections presented in the Figure 1, interactions with related files occur. The sections following the definition of ILOs are fully under the control of the user. Here are input exclusively data that describe the content of the course and the assessment. The user just has to pay attention when introducing numerical data, to meet the conditions required.

2.1. Preliminary data

For easier data management, the course description is divided into several sections. Specific relationships between the different sections of the course description are established using particular types of cells. There are available the following cell category types:

- *Selection cells*: here, the user is prompted to select a value from a predefined list. In this way, the user is prevented from providing wrong data. In most cases, the content of the option list is taken over from other files or worksheets. In this way, connections with other sources are done to force the obedience to some rules or standards;
- *Calculated cells*: these cells contain formulae. They are meant to relieve the user from making calculations and to ensure error-free content when it comes to numerical data that must obey some relationships;
- *Verification cells*: these cells also contain formulas, but unlike the previous ones, they are the base for a check. Always, such a cell is accompanied by another special cell, which either confirms that a condition is respected or displays an error message that prompts the user that an error occurred because of wrong data;
- *Free input by user*: these cells are fed with specific content by the user. This kind of cell is not subjected to any restriction and usually contains data that are specific to the course described.

In the next paragraphs, the meaning of the lists from which the user can select data is

presented. Despite the lists appearing as closed selected fields, they are not. In the samples below, they are populated with values to illustrate the significance of the list. However, the values that form the list could be taken from the course mapping, which could be table-shaped. In this way, it is ensured the unity of the course descriptions that belong to the same study programme. The modification of a selection list content is easy to do, by means of customizing the template. It is recommended that the cell to be password-protected, so the content of the list cannot be altered accidentally or by unauthorized persons. A common user can only select a value from the list, not to modify its content. They are presented below.

Course type. This defines the level of compulsoriness of the course: Core and Elective.

Course category. The contents of this list might depend on the description of the course by the Common Aggregation Hierarchy (CAH) codes [19]: Mathematics; Basic science; Computing; Design; Projects; Management; Economics; Ethics; Humanities; Engineering sciences; Communications; Law; Finance; Languages; Music; Drama.

Course level. This feature allows a correct insertion of the course in the study program (Bachelor Study, Master Study): Beginner; Intermediate; Advanced.

Type of activity. Several types of didactical activities can be added to the section dedicated to the description of the student workload. To each type of activity, a certain number of hours/week must be assigned: Lecture; Seminar; Lab; Project; Other activity.

Individual study. The list is also used in the student workload section to define the individual study activities and to assign the time allocated to each of them (hours/course): Study on books/book chapters; Study on course support; Study on bibliography and additional documents; Preparation of seminars/ labs/ projects; Preparation of homework; Preparation of papers/portfolios/essays; Tutorial; Other activity.

Assessment and exam preparation (hours/course). From this list, the type of assessment is to be selected: Preparation for exam; Written exam; Oral exam; Written projects; Lab journal; Other.

Assessment category: Formative and Summative.

Assessment type. After the set of assessment types is selected, the ILOs addressed must be assigned to each of them and mentioned their percentage in the final grade: Long Answer-Closed Book; Short Answer-Closed Book; Long Answer-Open Book; Short Answer-Open Book; Structured-Closed Book; Quiz-Closed Book; Presentation; Report; Demonstration.

ILOs number, ILOs addressed, and Credits: These are numerical lists. By these lists the user can bind the Intended learning outcome by its number identifier to different activities or titles in the contents of lecture/seminar/lab/project. The list provides unique numbers, or combinations, as 1, 2 or 2,3,4 etc.

The selection from lists enables the users of the tool to provide consistent course descriptions. Also, using the selection lists prevents users from entering wrong or inconsistent data. The list selection cells are marked by color. Clicking in a selection cell, next to it appears a downward arrow-shaped sign that, being pressed, unfolds the list to select from. In certain cases, the user is explained through a comment on the meaning of the selection asked. However, when needed, the selection cell may be left blank.

2.2. Sections of the course description

To facilitate data management, the content of the course description is divided into sections. Each section has its title emphasized by the background colour of the respective cell. Between the sections of the course description, specific relationships are defined to maintain the consistency of the data. Such relationships usually check through calculated cells whether certain conditions are met. For customization, tables can be filled with additional lines and columns. However, this can only be done by decision-makers, at a management level than that of common users. Changes is better to be password protected.

2.2.1. General Data about the Course Section

As its title shows, this section of the course description displays data that customizes the course among the others. The section plays the role of the heading of description. The fields to be filled in refer to the course name and code, which are supposed to fit to those stated in the academic programme description. The data for the fields *Course type*, *Course category*, and *Course level* are collected from lists, because of the appropriate values are fixed. The CAH classification of the course is defined by three codes, CAH1, CAH2, and CAH3 [19], which must reflect the contents of the course. The values are taken from special sources, according to international standards. For a correct choice of the values, the user is led using a link to the official source. The section ends with data about the person who is going to teach the course. Figure 2 shows the section, with one of the options lists unwrapped.

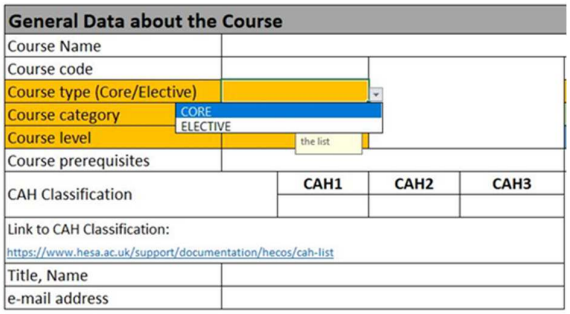

Fig. 2. *General Data about the Course* section

The activities included in *Contact activities* category are:

a) *Classical teaching* - lectures, seminars, lab/experiments, field, reading, simulations, discussions/forums, project, practical work, and others;

b) *Online and/or hybrid teaching* - online live/synchronous activities, live class meetings, live required office hours, guided student groups, and others. The synchronous activities are performed online, with all the actors connected simultaneously to the platform. This type of activities has the advantage of that they are interactive, facilitating the direct communication between the actors, both teachers and students.

- online asynchronous activities: video lecture of faculty or invited expert, recorded interview with expert, faculty-mediated online discussion forum (interactive discussions), moderated video viewing/discussion, required or scheduled communication with faculty, and others. The asynchronous activities are based on the recorded materials or any other digitally formatted resources. They can be accessed individually by each student, according to his/her own schedule. What is very important in the case of these activities is that the student can step through the resources in his own rhythm, and can benefit from self-assessing, so he advances to next subjects, when he appreciates that he has assimilated to a good extent the previous one. The contact activities can be face-to-face and/or online live activities (synchronous and/or asynchronous activities), depending on the curricula and requirements imposed by the university, especially when an unusual situation occurs, e. g. the pandemic. To calculate the total contact hours and credit hours could be used the following relationships:

$$T_{ch} = \sum_1^n A_{hi}\,; \qquad CH_{Tch} = \sum_1^n A_{hi} * T_{fi} \qquad (1)$$

where: T_{ch} – the total number of hours allocated to contact activities; n – the number of distinct contact activities foreseen for the subject; A_{hi} – the number of hours allocated to each of the foreseen contact activities; CH_{Tch} – the total credits allocated to the contact activities of the subject; T_{fi} – time factor. The time factor, T_{fi}, is established by the university according to the international/national rules. For example, could be used 1/(25..30) and reflects the relationship between the credits and time allocated to the type of activity, and one credit corresponds to 25..30 hours. The actual value may fall outside of this range, depending on the country/university regulations. It can be modified as a means of customization of the template.

The activities included *Individual activity (Non-Contact Hours)* are:

a) *Classical manner*: study on books/books chapters, study on course support, study on bibliography and additional documents, preparation of seminars/ labs/ projects,

preparation of homework, preparation of papers/ portfolios/essays, tutorial, and others;
b) *Online and/or hybrid*. For the case of hybrid and/or online teaching the following supplementary activities could be added: synchronous (online study groups, live working student group projects), or asynchronous (discussion board, videos, student blogs) and others. To calculate the time, one can use the relationships:

$$T_{ish} = \sum_1^m A_{hi} \qquad CH_{Tis} \sum_1^m A_{hi} * T_{fi} \qquad (2)$$

where: T_{ish} – the total number of hours allocated to individual activities; m – the number of distinct individual activities foreseen for the subject; A_{hi} – the number of hours allocated to each of the foreseen individual activities; CHT_{hi} - the total credits allocated to the individual activities of the subject; T_{fi} – time factor.

Activities included in Assessment category are:
a) *Classical assessment*: preparation for exam, written exam, oral exam, written projects, lab journal, and others;
b) *Online and/or hybrid assessment*: online exam, online project defending, online lab journal, and others.
The relationships used in this case are:

$$T_{ah} = \sum_1^l A_{hi} \qquad CH_{Tah} = \sum_1^l A_{hi} * T_{fi} \qquad (3)$$

where: T_{ah} – total number of hours allocated to assessment activities; l – the number of distinct assessment activities foreseen for assessment; A_{hi}– – the number of hours allocated to each of the foreseen assessment activities; CHT_{ah} – the total credits allocated to the assessment activities of the subject; T_{fi} – time factor.

Assigning the time factor for each type of activity is very important. It is recommended that balancing the number of activities, their allocated hours, and time factor, to get to an integer number of credits. Of course, the balance of the classical and online activities can be adjusted according to the universities' policies, the actual social conditions, to reflect correctly the actual situation, without altering the contents of the described course.

This task is performed by selecting the appropriate choice from a menu list. There are available individual ILOs numbers, and all possible combinations of 2, 3,.. 6 ILOs. Figure 3 displays the section with the comment-prompt unfolded.

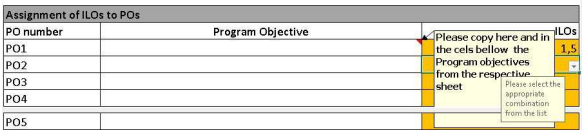

Fig. 3. The section Assignment of ILOs to POs

2.2.2. Course Content Section

This section is structured into four subsections, identically organized. They refer to the subject list for the different didactical activities: lectures, labs, seminars, and projects. Depending on the structure of the didactical activities of the course, some of the subsections may be not filled in, or even removed from the file. However, the required sections are similarly filled in: the collection of subjects must be listed – one entry in each line of the table. For every subject, in the column headed ILO(s) addressed, the appropriate value is selected from the available list, and in the one headed *Duration (h)* the time allocated must be entered, in a free input cell. As the subjects are input and their duration allocated, the total number of hours is automatically calculated. While this amount differs from the total assigned to the activity in the section *Student Workload*, an error message is displayed in the cell labelled TOTAL at the bottom of the table, as shown in Figure 4. According to the amount of data to be displayed in each subsection, some lines may be added or removed.

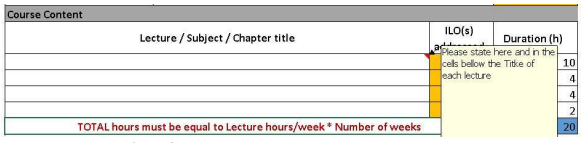

Fig. 4. The section Course Content

2.2.3. Assessment Section

The last section of the Course description refers to the *Assessment*. This section centralizes data about the way the assessment is done. In the

column headed *Assessment category,* one of the two options available in the associated list (Formative / Summative) must be input. In the *Assessment type* column, the input is also selected from a list that contains fifteen entries: Long Answer-Closed Book, Short Answer-Closed Book, Quiz-Closed Book, Report, and others. The column headed *ILO(s) addressed*, is filled in in the same way as the homologous columns in other sections. The values in the column *Percentage* of final grade are free input. They must meet the condition that their sum must be 100. Otherwise, an error message is displayed at the bottom of the table. A column where remarks can be listed is also available (Figure 5).

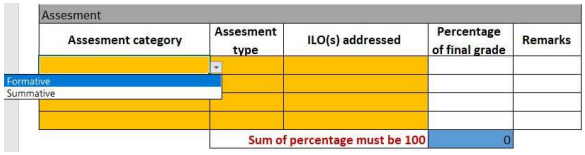

Fig. 5. The section Assessment with an input list unfolded

As one can easily observe, the sections presented above act as pieces of a puzzle that form an object with a clear identity. What makes the pieces of the puzzle fit into each other are the links and connections that perform cross-checks between the data in different tables. If any of the checks fail, the ensemble unit is compromised. In such cases, the reason of the error is marked by a message that explains the cause of the error, and where it comes from.

3. RESULTS AND DISCUSSION

The most suitable illustration of the results that can be obtained by the tool presented here is a course description based on real data. The sample presented below is the final output, free of errors in terms of checks performed on data in different sections of the course description. The course description refers to a subject in the manufacturing engineering area. The proposed framework to set up a course description within an academic programme brings the novelty of providing a template that formalizes the organization of the data. This allows for achieving uniform course descriptions, supported by consistent data. The main reason for this ensured data consistency is that many of the data used in different courses are collected from the same source: the programme mapping. For instance, the set of ILOs is accessed from a unique source to all the course descriptions.

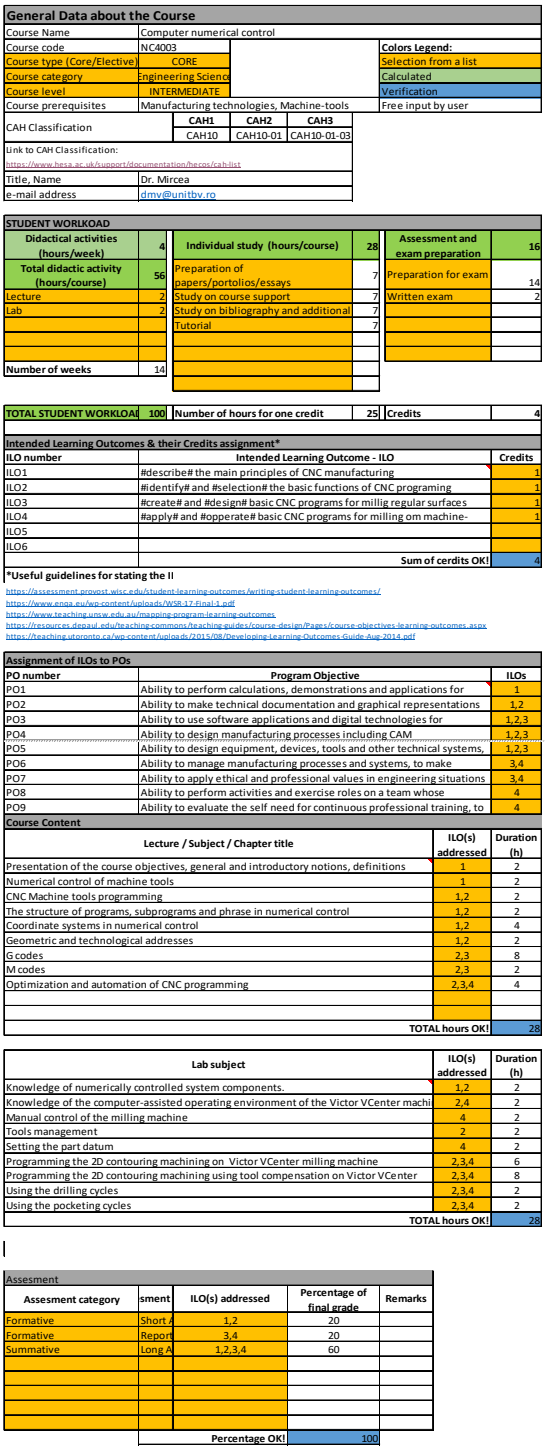

Fig. 6. The general image of a filled-in course description

The tool presented here ensures the issuing of error-free course descriptions based on consistent data. This is based on the verifications automatically performed, which reveal any possible errors, their source, and how they can be fixed.

One of the most important attributes of the course description, as it is presented here, is that it can be adopted as a standard in a higher education institution, so the unity of the format the courses are shaped, at least within an e-learning platform, can be ensured. A general image of a course description filled in with data is presented in Figure 6.

3.1. Possibilities of using the template in E-learning platforms

The course description tool presented here is suitable for using in E-learning platforms. No matter the means used to set up the template (here a spreadsheet was used, but a database can also be used, or other software instruments) the template can be integrated into an E-learning platform. In fact, for such a purpose it was designed. Whichever the software is used to create the template, it can be integrated in an E-learning platform. The drawback in this case is that the user must download the template, fill in with data, and then upload it again. Some other ways to integrate the template in E-learning platforms (i. e. Moodle) are briefly presented in the following sub-sections.

The advanced users, skilled also in programming, can integrate the template into E-learning platforms using plugins.

The integration of a form-based template to a digital e-learning platform, for example Moodle, requires choosing the appropriate format (i.e. plugin), that follows the structure, flexibility and clarity of the data entry layout while enhancing usability through interaction with other platform-wide available tools.

Moodle offers several possibilities for creating a form, ranging from basic feedback activity plugin and questionnaire plugin, up to custom-created HTML-based forms or custom-created plugins. While considering the mandatory features and main functionality that the Course description form must contain, like interdependent drop-down selections and calculated fields, the trivial solutions are technically surpassed by the ones that offer more customization options. One of the preferred solutions is either choosing a third-party form builder (i.e. 123FormBuilder) or focusing on the standard Database Activity. Since a pragmatic middle-ground implementation is pursued throughout this research, a Moodle-provided plugin is one of the best solutions to be considered. Being a standard module, it is freely available and well-integrated into the Moodle ecosystem, thus meeting most of the requirements of the forms. Its advantages include:

- High customizability: each entry can be directly mapped to a Moodle database field, including dropdowns and text areas for detailed descriptions;
- User Accessibility: Since users (i.e.Teaching staff) are accustomed to the web interface of e-learning, one can easily input, view, and revise course descriptions;
- Data portability: the entries can be exported in CSV or Excel format, facilitating integration with external systems (e.g., curriculum databases, accreditation documentation);
- Template reusability: the activity can be duplicated across multiple Moodle courses or semesters, ensuring consistent data entry and minimizing administrative over-head.
- Internal data validation: predefined dropdown values prevent inconsistent input, much like Excel's data validation functionality.

Although having so many advantages, more advanced functionalities like calculated fields and cascading drop-downs need to be implemented through client-side injected JavaScript code. There are various JavaScript boiler-plate examples to overcome this challenge, and following appropriate naming conventions for the fields, as well as HTML ID's should enable an event-driven approach in changing several fields, based on the previously stored input.

To conclude, adapting form-like spreadsheets to Moodle-based workflows eases the interaction of users with an accustomed

interface. Therefore, choosing the Database Activity module offers the best balance between structure, functionality and long-term maintainability, while supporting most of the features and integrations within the Moodle environment. Further processing of the form can bring it to its original appearance. In Figure 7 there are presented two samples of the aspect of the defined plugins in an intermediary stage, before being processed to align with the original appearance of the template.

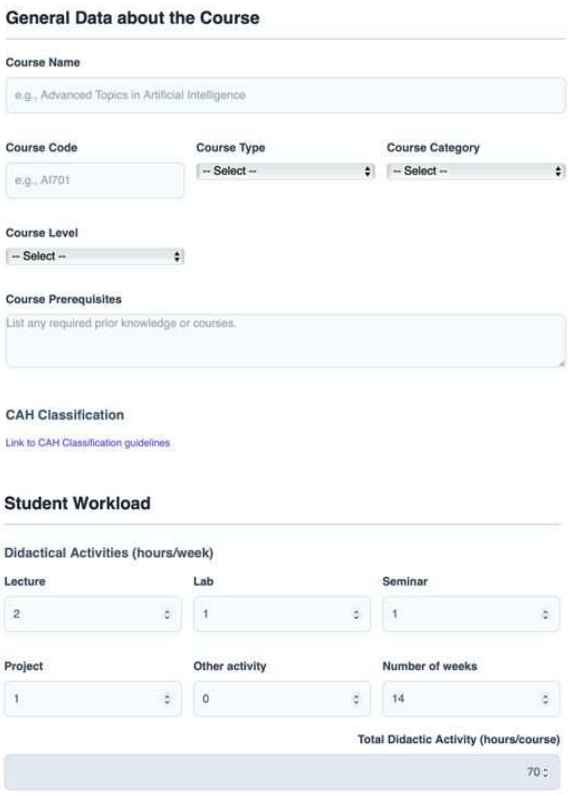

Fig. 7. The intermediary appearance on the E-learning platform. (a) the section General Data; (b) the section Student Workload/

3.2. Customizing the template

When it comes to adapting the template for different disciplines, one may notice that the general format of the course description must be respected, to keep the unity of the ensemble it belongs to. However, the user has several means to customize the content of the description. For instance, the number of ILOs may be adjusted for each subject, the distribution of credits among the ILOs or activities, the number and type of activities foreseen for a subject, and others. On the other hand, if there are required adjustments at the level of an institution, in terms of formulae (e.g. the number of hours corresponding to a credit), the template can be modified accordingly and then delivered to all the actors supposed to issue a course description. To prevent unwanted or accidental alterations of the formulas, the cells containing them can be password-protected, so the modifications can be operated only by authorized persons.

After filling in the template with data, it can be saved as a pdf file or other import/export files available in Excel. It should be noted that the system has been developed in such a manner that it could be usable with e-learning platforms. Consequently, it can be uploaded or imported as a resource onto such platforms.

Despite the template supposing some rules and clear relationships between its sections, affords the user a certain degree of autonomy in customizing the template to suit specific requirements. For instance, new rows can be added, or rows can be removed, according to the specifics of the subject. Modifying the number of lines does not affect the integrity of the template. The cells containing reference data (time allocated to activities, credits) are placed at the top of the table and are referred to absolutely in the formulas. Hence, adding or removing rows to the sections below the section Total student workload does not affect the consistency of the data.

4. CONCLUSIONS

The tool presented in this article displays novelty. This is argued by the following statements:

- The concept of the Course description has an integrative approach that allows connecting the various aspects, such as general data, student workload, credits, activities, ILOs, and assessment in a unitary form, through logical and quantitative relationships;
- No matter the means used to set up the template, the integrated approach is important, which allows both customizing and integrating into E-learning platforms;
- Due to its capabilities, the new tool can be used as a management instrument for the subject and the study programme it belongs

to, instead of being just a description of contents;
- To facilitate data management, several types of cells, with distinct functions and modes of completion are employed. The use of a range of colours serves to facilitate the identification of the different items;
- The form is provided with checking mechanisms, thus reducing the risk of errors.

Even though the present instrument signifies an advancement in the direction of a simplified and more secure process for the establishment of course descriptions, there is nevertheless scope for enhancement. The authors have already foreseen future research developments towards a more effective and reliable instrument. According to the experience gathered by the authors during the current research, some future ways to develop the tool have been stated. The most important of these is going deeper with the automation of data transfer from the initial source – the academic programme mapping – to the course description. Another way to improve the effectiveness of the course description could be the automatic transfer (copy) of some data from one section to another, such as the types of assessments already selected in the *Student Workload* to *Assessment* section.

Finally, a flexible structure of the course description would be helpful. This means that the subsections labelled *Lab subjects*, *Seminar subjects*, *Project subjects* to be automatically added or removed, according to the list of activities already selected in the *Total didactic activity (hours/course).*

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Un nou instrument pentru descrierea cursurilor utilizabil în dezvoltarea platformelor de învățare online

Proiectarea unui program academic este o sarcină complexă, care trebuie să ia în considerare numeroase date. Elementul central al unui program academic este cursul. Acesta trebuie definit cu mare acuratețe prin tipul său, categoria, nivelul, numărul și tipul activităților, numărul de ore alocate fiecăreia, numărul de credite, rezultatele învățării. Lucrarea de față propune un instrument nou și original, care funcționează ca un fișier-șablon ce îl ajută pe proiectantul cursului să furnizeze o descriere completă și coerentă, respectând anumite condiții definite anterior. Noutatea instrumentului constă într-un document sub formă de tabel, care combină câmpuri selectabile din listă, câmpuri calculate, câmpuri cu introducere liberă și câmpuri de verificare ce semnalizează apariția oricărei erori și oferă sugestii pentru corectarea lor în procesul de descriere a cursului. Folosind acest instrument, proiectantul poate furniza cu ușurință o descriere fără erori, combinând date colectate din tabele interconectate și adăugând informații specifice, astfel încât aceasta să poată fi ulterior utilizată în platforme de e-learning prin fișiere de import/export.

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