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IMPLEMENTATION OF THE MOODLE “LESSON” ACTIVITY IN THEORETICAL, OPERATIONAL AND PRACTICAL SUBJECTS

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Abstract: GOAL: To design and apply Moodle “Lesson” activities adapted to subjects of different modalities in order to analyze their teaching possibilities with students of different Grades.

Material and method. Different pedagogical strategies have been applied through the Lesson activity, specifically, as interactive fiction in the theoretical subject Physiology of the Degree in Physical Activity and Sports Sciences; as role-playing simulations in the theoretical-practical subject Motivation and emotion of the degree in Psychology; and as self-directed learning of a new topic in the practical subject Electronic Technology of the Industrial Organization Engineering degree.

Results. The total number of students to whom the model was applied was 154. The percentage of participation was higher in the small groups. The average grades for the Lesson activity were in all cases higher than 9.1 points out of 10. In the group application, motivation and student-student communication stand out, and in the individual application, autonomy and self-demand. The average score for the implementation derived from the teaching rubric was 7.6 points out of 10. The students highlight having learned and would recommend their classmates get involved in this activity.

Conclusions. The Moodle “Lesson” activity is postulated as an interactive tool for applying innovative methodologies in different subjects. Students recognize it as a novel way of acquiring both theoretical and practical knowledge. The competency results in terms of content and development of the activity have been satisfactory.

Keywords: lesson, learning, ICT, modality, dynamization.

INTRODUCTION

Traditional teaching based on master classes by the teacher, even when reaching the established training levels, limits the training process to listening and transcribing the information. This methodology results in deficiencies in the desirable competencies in the university environment, so much so that the Bologna Declaration calls for facilitating activities for students to develop their capacities for autonomous work, organization and co-responsibility in learning, which are essential for the development of innovation. expected later. ¹

The “Lesson” activity as an educational resource on the Moodle platform (hereinafter, Lesson) allows the teacher to present content in a dynamic and flexible way. With this resource you can create a set of pages in which content and multimedia resources can be inserted. The foundation of the Lesson activity is the interaction with the content and with questions related to said content, that is, it allows the principle of practice to be put into execution of e-Learning, where the practice is integrated with the instruction material. ²

A Lesson, therefore, will be made up of a series of pages, texts or other types of resources that the student must go through and study. Such a lesson can provide interactive content in an interesting and flexible way. These contents consist of a series of web pages (normally written with the HTML editor integrated into Moodle) that offer the student information and that, optionally, can end with a question related to the contents presented with one or more possible answers. Depending on the student’s response to that question, the resource itself will allow them to advance to another page, force them to go back, place them at a fork, etc. That is, navigation throughout the lesson depends on the student’s interaction with the questions posed in each case, generating its

own dynamic itinerary.³

The action of being able to complement the base material of the subject, in a multidisciplinary and synchronous way, allows the creation and enhancement of a course in which each level is actively designed and with quality requirements for an enriching experience from the aspect. methodological and instructive, both for the tutor and the student.

The use of each tool that Moodle offers is an opportunity to amplify learning, along with energizing the modular structure with which the methodological contents are designed on this virtual platform.

OBJECTIVES

The main objective of this project has been to design different styles of use of the Lesson activity and apply them in the corresponding subjects according to their modality in order to analyze their teaching possibilities with students of different Grades.

The secondary objectives were:

- Evaluate the degree of implementation of this resource according to the modality of the subject and the profile of the students according to the Degree studies that are applied.
- Compare the usefulness in achieving training objectives according to the modality of the subject and the profile of the students according to the Degree studies applied.
- Develop an interdisciplinary collaboration network between teachers from different Degrees, Departments and Centers.
- Improve the digital skills of the teachers involved, with the possibility of extending it to the rest of the teaching staff through the dissemination of the learning and results obtained in this project.

METHODOLOGY

AREA OF APPLICATION

Degrees from various branches were chosen that had as a common link the difficulty of passing a subject compared to the rest of those that made up their corresponding academic guides. This difficulty is known and manifested both by the students and by the results usually obtained.

A choice was made of the programs or blocks where the lessons were going to be applied in each of the following subjects according to modality⁴:

- Expository theoretical subject: 'Physiology' of the Degree in Physical Activity and Sports Sciences.
- Practical-theoretical subject with laboratory: 'Electronic technology' of the Degree in Industrial Organization Engineering.
- Expository operational subject: 'Motivation and emotion' of the Degree in Psychology.

Degrees	Subjects	Course/type	Modality
Physical Activity and Sports Sciences (CAFD)	Physiology	1st / mandatory	Theoretical
Industrial Organization Engineering (IOI)	electronic technology	2nd / mandatory	Practical-theoretical
Psychology (PSICO)	Motivation and Emotion	1st/basic	Operational

Table 1. Descriptive of the subjects in which the Moodle Lesson has been applied

STRATEGY

CHOICE OF STRATEGY ACCORDING TO SUBJECT

For each subject, different pedagogical strategies have been used that can be applied in the Lesson activity in Moodle:

- In the case of Physiology (CAFD

Degree), the interactive fiction strategy was considered. The Lesson can be used to create a “choose your own ending” type of story where the student reads a page (or even watches a video/listens to an audio file) and then decides on the character’s next move. This framework could be used within the Good Practices guides, in which the student seeks to behave responsibly by making decisions for situations that are in a specific context.⁵

- In the case of Electronic Technology (Degree in Industrial Organization Engineering), self-directed learning was considered. It is possible to use the Lesson to introduce a new topic. The student can start from scratch, but has the opportunity to progress at their own pace, reviewing what they are not sure about and moving forward when they feel ready.⁶

- In the case of Motivation and emotion (Degree in Psychology), it was considered to carry out role-playing simulations/decision-making exercises. It is interesting to use the Lesson to configure situations in which the student has to make a decision at each step and the scenario changes according to his selection⁷. This could for example be in the context of “a medical emergency”, for example, deciding on the correct treatment, or a client relations exercise, learning the best way to deal with an uncomfortable client. It can be an effective resource when working on “*soft skills*” that correspond to “Knowing Being”.

DESIGN AND FORMAT

A pilot subject ‘PIE08-2122’ was requested to be registered in Moodle for testing. All members of the project had a double profile as teachers and as students.

A battery of tests was carried out with different structures from greater to lesser complexity. Each teacher responsible for the subject submitted his Lesson to a proof of concept with the participation of the remaining members as students.

After carrying out several concept tests for each subject, a specific model was selected according to its assigned strategy in search of a correct understanding of the procedure and adaptation to the content.

In general terms, for this first implementation the following were established as reference criteria:

- Simple navigation with content pages and targeted question pages.
- It is allowed to include branches.
- The number of pages of each lesson was determined by the content to be covered.
- Test the logical order derived from the tests carried out to improve understanding of the contents
- Include content pages followed by leading question pages.
- Continuous visualization of points obtained with respect to the total answered is allowed.
- Continuous display of progress bar is allowed.
- Multiple choice questions are allowed, which can be single or multiple response.
- When a student answers the question correctly they will advance to another page, while if they answer incorrectly they can go back to a previous page or the same page will be shown again.

- It is possible to reach the end of the lesson following different itineraries depending on the answers offered by the students.

- Lesson repetition is not allowed as it is evaluable.

ADAPTED STRATEGIES AND CONTENT EVALUATION

The necessary adaptations in the strategy and evaluation of the content for each subject with respect to the reference criteria are shown in the following table.

EFFICIENCY EVALUATION AND SATISFACTION SURVEY.

The evaluation of efficiency was carried out by the teachers using a rubric prepared from the table proposed by `` Universidad de Santo Tomás de Chile `` (2019), which allows reviewing the dimensions of this impact and the limitations that this resource could also present. Lesson in developing a course in Moodle (Table 3).

An anonymous satisfaction survey was carried out on the students to find out their opinion about this teaching activity. The questions of the satisfaction survey are based on those standardized for the analysis of a known and applied dynamization activity, specifically the satisfaction survey of the *Kahoot gamification tool* ⁸ composed of the following questions:

- Question 1: Rate this activity from 1 (not at all fun) to 5 (very fun) (not at all/little/neutral/some/very).
- Question 2: How did you feel after doing it? (positive/neutral/negative)
- Question 3: State true/false if 'you have learned something' (true/false)
- Question 4: Indicate true/false if 'you would recommend doing this activity to

your classmates' (true/false)

- Question 5: Indicate true/false if 'you would like to repeat this activity with other subjects or contents.' (true False).

RESULTS

The total number of students to whom the model was applied was 154. Taking into account the number of students per group, it was assigned to subjects with a diverse number of enrolled: high (CAFD), medium (PSICO) and low (IOI) (Table 4).

In the analysis of the results, two sections must be considered: training results and implementation results.

Characteristics	CAFD	IOI	PSYCHO	TOTAL
Number of enrolled students	85	fifteen	54	154
Number of students who carried out the activity (%)	55 (64.7)	15 (100)	52 (96.3)	122 (79.2)
Average grade	9.2	9.1	9.4	9.2
Students who took the survey of those who carried out the activity (%)	8 (14.5)	10 (66.7)	52 (100)	70 (57.4)

Table 4. Participation and rating results for the Lesson activity.

TRAINING RESULTS

Participation in the Lesson activity and completion of the survey were greater in the groups with fewer students. Regardless of the initial involvement, positive results have been observed in the acquisition of content with average scores in the evaluation test higher than 9.1 out of 10 points. This result seems not to be affected by the number of students carrying out the activity.

Phases	Subjects		
	CAFD	IOI	PSYCHO
Type of material available	Theory manual and self-assessment tests	Script for self-execution of the contents of each topic.	Notes with the contents of the topics involved.
Strategy	<ul style="list-style-type: none"> - Complex navigation with 3 forks or initial routes. - Linear navigation within each route - Mandatory to complete a complete route. - You can access the other 2 remaining ones to work on different contents. 	<ul style="list-style-type: none"> - Complex navigation with 5 forks or initial routes. - Linear navigation within each route - Display of points obtained with respect to the total answered. - Progress bar display. 	<ul style="list-style-type: none"> - Complex navigation with 1 first mandatory initial route of greater difficulty, two subsequent routes of medium and easy voluntary level. - Linear navigation within each route - Display of points obtained with respect to the total answered. - Progress bar display.
Content evaluation	<p style="text-align: center;">Group</p> <p>Correct questions: 1 point Failed questions: 0 points.</p> <p>If the answer is wrong, it returns to the same question, it does not allow progress until the correct answer is marked (it only adds points if it is answered at the first opportunity).</p>	<p style="text-align: center;">Individual</p> <p>Correct questions: 1 point Failed questions: -0.25 points.</p> <p>If a question is failed, 0.25 points are subtracted, not having the option of repeating it, so they would have to move on to the next question.</p>	<p style="text-align: center;">Group</p> <p>Mandatory initial route – Practice 1 difficult level: Correct questions: 3 point Failed questions: 0 points.</p> <p>Optional route – Practice 2 medium level: Correct questions: 2 point Failed questions: 0</p> <p>Optional route – Practice 3 easy level: Correct questions: 1 point Failed questions: 0</p> <p>In this case, the students could decide based on their successes and failures whether to continue asking more questions to obtain a better grade or to settle for the one obtained.</p>
Inclusion of Lesson evaluation in the final grade	<p>Percentage of Lessons in final evaluation: 20% of the grade. 12 Lessons. Each Lesson: 1.6% of the final grade.</p>	<p>Percentage of Lessons in final evaluation: 40% of the grade. 2 Lessons. Each Lesson: 2.5% of the final grade.</p>	<p>Percentage of Lessons in final evaluation: 30% of the grade. 1 Lesson Each Lesson: 30% of the final grade.</p>
Final survey	Yes. Voluntary, free and asynchronous access after activity.	Yes. Voluntary, free and synchronous access after activity.	Yes. Mandatory for qualification.
Number of lessons evaluated*	12	2	1

Table 2. Summary table of strategy and evaluation adaptations in the implementation of the Moodle Lesson

* The students are not used to this type of teaching, a situation that makes it difficult to carry out the activity in the time and manner planned, especially in groups with a high number of students. In order to maintain the correct monitoring and programming of the subject, it was decided to analyze the results of a lesson implementation by subject.

Easy to use It can be complicated to set up. Plan the lesson first.	1 (unplanned, complicated to set up)	2 (planned, complicated to set up)	3 (planned, no configuration complication)
Transfer of information It is a tool to present information in a structured and guided way. Allows you to implement adaptive learning	1 (does not allow structured presentation, does not allow adaptive learning)	2 (allows structured presentation but does not allow adaptive learning; or vice versa)	3 (allows structured presentation and allows for adaptive learning)
Learning Assessment Allows evaluation and qualification when used as a structured questionnaire, scenario, case study, <i>role play</i>	1 (does not allow evaluation and grading)	2 (allows evaluation but is not suitable for grading)	3 (allows evaluation and is suitable for grading)
Communication and interaction Can be used to interact between participants (tutor and students)	1 (does not allow interaction)	2 (allows interaction between students but not with the tutor; or vice versa)	3 (allows interaction between participants: tutor and students)
Collaborative elaboration or resolution Allows you to collaborate and create content together (tutor and students)	1 (does not allow collaboration)	2 (allows collaboration between students in resolution, does not allow collaboration in content development)	3 (allows collaboration in preparation and resolution between students and tutor)
Bloom's Taxonomy Requires the 6 cognitive skills: remember, understand, apply, analyze, evaluate and create It requires being creative to manage the evaluation of the 6 cognitive skills.	1 (does not require any skills, are not evaluable)	2 (requires at least half of the skills, some are assessable)	3 (requires all skills, all are evaluable)
TOTAL	6	12	18

Table 3. Lesson rubric -adapted from National E-learning Directorate³ - and evaluation result.

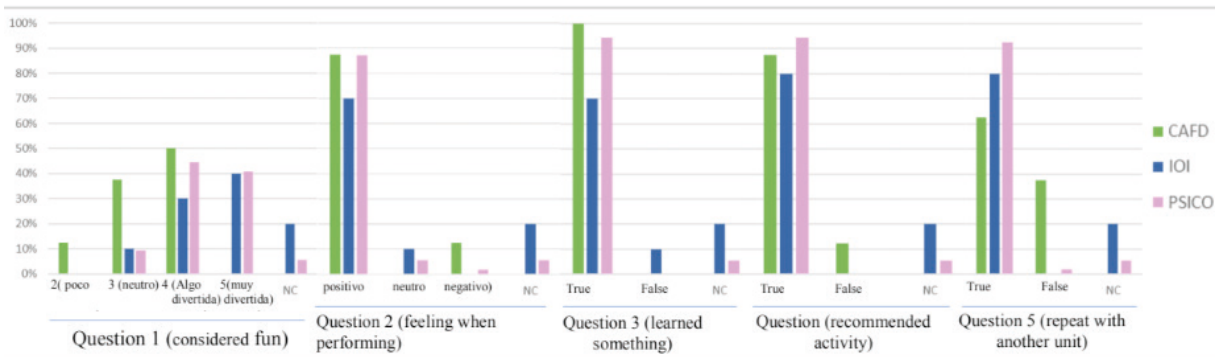


Figure 1: Responses by Grade to the questions of the satisfaction survey

IMPLEMENTATION RESULTS

- In cases of group application (with individual recording of responses to facilitate grading), seeing behavior of interest and participation on the part of the most advantaged students encourages the group to get involved in the activity and increase student communication. student.

- The evaluation of the content and its inclusion in the final grade is the objective for which they show the most interest.

- Students recognize that the treatment of the material to solve the tasks requires more dedication and responsibility for their own training than what they are accustomed to assuming, being one of the European challenges in education¹. In those cases in which a search for additional information was necessary to resolve doubts, this investigation is the most complex for them as they do not have a critical vision to differentiate truthful and quality sources of information.

- In the case of individual application, answering the questions about the material prepared by themselves, the involvement that the students must have had from the first moment, to achieve a good result, has been reflected. Also, highlight that they have motivated themselves to have a good grade and encouraged to look for the correct answer.

- When the Moodle lesson is presented as a decision-making process in which students must weigh their grade, choosing based on their previous performance whether to continue with the Lesson to improve their grade taking into account that the content is becoming easier each time, it is observed an acquired commitment (*"engagement"*) with the task, which results in greater

satisfaction with the effort made, as has been evidenced in other studies.⁹

TEACHER EVALUATION

The results of the application of the developed rubric were the following: CAFD with 13 points out of 18 (7.2 out of 10); IOI with 14 points out of 18 (7.8 out of 10) and PSICO with 14 points out of 18 (7.8 out of 10). The detailed results are shown in Table 5.

Globally we can consider that it is a tool that requires great prior planning with a certain complexity. Once applied, it is observed that it provides students with structured and adaptive learning. Regarding the learning results, it allows a clear evaluation of the contents, and there may be cases in which the grade obtained does not reflect in detail the learning achieved. In turn, depending on the application methodology, individual or group, the latter allows interaction between students, but interaction with the teacher is reduced.

CRITERIA	CAFD	IOI	PSYCHO
Easy to use	2	2	2
Transfer of information	3	3	3
Learning Assessment	2	3	3
Communication and interaction	2	2	2
Collaborative elaboration or resolution	2	2	2
Bloom's Taxonomy	2	2	2
Total (out of 18 points)	13	14	14

Table 5. Results of the application of the Lesson rubric

STUDENT SATISFACTION SURVEY

Knowing the scarcity of oral and objective opinions that an opinion question presented by the teacher usually poses, we consider it relevant to obtain more information on the perception of the activity through the analysis of the responses from the final survey.

The overall percentage of enrolled students who take the surveys is greater than 55%.

In the analysis of these data, the different response depending on the Grade must be taken into account, considering the strategy used to request its completion (Table 2). Only in the event that the survey is mandatory (PSICO) is it answered by all students; if it is linked to the activity and is carried out in person following the activity, the also relevant percentage (IOI); In the case of requesting voluntary assessment linked to the activity to be assessed, the percentage of responses declines noticeably (CAFD) (Table 4).

In general terms, 43.1% of the students considered this activity 'somewhat fun' (4 points out of 5), 84.7% had positive feelings when doing it, 91.7% considered 'having learned something', 91.7% would recommend their classmates do this activity and 87.5% would like to repeat this activity with content whose difficulty is not high.

Analyzing in detail by subject (Figure 1), the best ratings are for PSICO and IOI in the questions about whether they consider the activity 'very fun' (40.7% and 40% respectively), as well as if they would like to repeat this activity with another Unit (92.6% and 80.0% respectively).

On the other hand, in the rest of the questions the best results are obtained in CAFD and PSICO: the activity gives them positive feelings (87.5% and 87.0% respectively); they consider they have learned something (100% and 97.8% respectively); and would recommend this activity -PSICO (94.4%) and CAFD 87.5%).

All questions presented more positive responses than neutral or negative ones. This pattern is repeated in all the subjects analyzed.

There is variability in the number of students who do not answer any question, although they do access the questionnaire (20% in IOI, 5.56 in PSICO).

LIMITATIONS OF THE ANALYSIS

It is not possible to do a correlation analysis between content results and perception of the activity due to the anonymity of the final survey and that not all students who did the activity answered said survey.

It is necessary to make improvements in the following implementations, such as stimulating participation and prior study through online questionnaires administered together with the study material and homogenizing the feedback strategy by students in order to extract more comparable and extrapolated results.

Because this is the first implementation and comparison of the activity, we limit ourselves to offering an evaluation rubric adapted to this activity as an implementation reference, waiting to have the results of the following improved implementations to prepare a guide for implementation. good practices on Moodle Lesson design according to the modality of the subject.

CONCLUSIONS

The Moodle "Lesson" activity has demonstrated its validity as a teaching tool, with better use and performance in small groups of students. The students are not adapted to working with this dynamic, but after completing it they consider that their greater involvement can offer good results.

Students' motivation for autonomous learning and the consideration of the teacher as a guide and support for their academic training must be stimulated. In this sense, improvements have been detected in the planning of the activity for future implementations in search of greater involvement, clarity of the process and participation.

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