

DESIGNING A RUBRIC FOR EVALUATING PERSONAL LEARNING ENVIRONMENT

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Abstract

Personal Learning Environment (PLE) is the set of tools, information sources, connections and activities that each person uses assiduously to learn. There are some elements to be considered in order to make a better explanation about what a PLE is, although they are not the same elements in every definition, here we're presenting those elements common to all definitions reviewed in the literature: Learning mediated by interaction; Active role of learner; Multiplicity of content; Diversity activities; Accessibility and ubiquity of web tools; and Ownership of web tools.

This difference of elements has also generated different ways of assess a PLE, therefore this study aims to unify theory and best practices of expert judges. In order to design a rubric for evaluating a Personal Learning Environment, five interviews with experts PLE users were made it, the elements mentioned before were considered in the interviews. Participants were selected because of their use of Internet tools, frequency of use and related to everyday work activities through internet, which in every case was at high level of use and expertise. Semi-structured protocol of interview was used and supported by audio recording.

We interviewed each expert in their workplace following the format of semi-structured interviews in which they were asked to show how they used Internet tools for learning purpose. Each of them was detailing the tools and their use. Interviews were transcript. From the content analysis categories and evaluation criteria were created, and the rubric items were designed.

Content Validity Ratio (CVR) was obtained, four judges has been participated evaluating each of the items in the rubric, considering if the item in their opinion was: 1) Useful 2) Useful but not essential; or 3) it is not necessary.

The Content Validity Index (CVI) was calculated by averaging the scores resulting from all criteria in the section. Finally 13 criteria were considered to be part of the rubric.

The procedure proved to be robust to build and validate this instrument that will help evaluate a PLE and then to determine a level of development objectively for these environments, which can give rise to other quantitative analysis, as correlations and linear regressions.

It was important to consider that studies show differences in the design of the learning situation, which can vary in relation to the way of using the PLE and, therefore, how to evaluate their use. Another aspect in the design of the rubric was trying to find out how each student create their own PLE, because this creation is unique for each student, but at least to propose a common starting point to assess this kind of internet environment for learning.

Keywords: Personal learning environments, rubric, assessment, evaluation, internet, web2, learning.

1 INTRODUCTION

Education has been helped by the emergence of Internet, since the emergence of educational pages, use e-mail, to online education through learning management systems like Moodle or Blackboard.

These changes have favored constructivist theories and models that place the student at the center of the learning process. In this regard there are two features that position the student as the architect of his own learning process: Interactivity, and the ubiquitous Web 2.0 tools and the development of online tools accessed from different devices (PC, smartphone or electronic tablet), have enabled bidirectional communication between the web and the user, as well as contact with other synchronous and asynchronous manner [1] and the self-learning, the tools of Web 2.0 provide opportunities to strengthen learner autonomy, making it purposeful and participant in the choice of resources used.

New forms of see and conceive the learning process (more dynamic, bidirectional, creating content and sharing it with others) have led to the emergence of new proposals to take advantage of Internet features, one of which is the Personal Learning Environment (PLE).

PLE spread online from the ability to create and consume information; however, it requires that the learner count on some skills necessary to be a successful user. When we talk about a PLE we refer to the set of tools, information sources, connections with others and activities that each person uses assiduously to learn about an objective [2].

There are elements that help define a PLE, these cover aspects such as context, the apprentice, tools, type of content and activities that can be undertaken. These common elements are listed below:

- Learning mediated by interaction. The importance of the processes related to social interaction and collaboration between learners is highlighted [3], [4]. The interaction with the user community is a means for collaborative product development, web tools modification of these products and the dissemination of educational resources through the web [5], [12].
- Active role of learner. Guided troubleshooting and learning motivated by personal interests learning is privileged [1]. PLEs allow each student to select the resources and sources of information deemed relevant according to the objective to be achieved, also select the display format their prefer either audio, video, text or images to customize their environment [1], [5], [4].
- Multiplicity of content. Learning objects are not limited to the material prepared by the teacher, but extends over the entire Web. In this sense, it is the skills and abilities of the student to find, select and use appropriate content for purposes that will determine the achievement [5].
- Diversity activities. The diversity of tools in the PLE allow a variety of activities that go beyond the search for information, including reflection, development of new information and disseminating it [6].
- Accessibility and ubiquity of web tools. The tools that learners integrate into a PLE are accessible from devices connected to the network, both personal computers and mobile devices, allowing learning in different contexts, spaces (home, office, transportation) and at different times [7], [8].
- Ownership of web tools. The learner integrates tools at their PLE related purposes to achieve the target, giving them a use and a meaning to each of them [9].

Each of these elements are a constant in a PLE, but there are different activities that are considered important when using a PLE. From the theory, they have proposed some general activities that can be carried out in the PLE and similar environments. Among them are different approaches. In the field of new literacies Coiro and Dobler [10] suggest activities for reading, evaluation, synthesis and share information. From the field of MOOC Kop [6] proposes four activities to add, connect, create and share information with others. Meanwhile Cabero [4] returns to Dabbagh and Kitsantas [9] are consistent with models of self-regulated learning and proposed planning activities, self-monitoring activities, through social interaction and reflection on individual and collaborative level. In another effort, Adell and Castañeda [2], in accordance with Attwell [7] suggest reading strategies, reflection strategies and relationship strategies.

About studies show differences in the design of the learning situation, which can vary in relation to the way of using the PLE and, therefore, how to assess its use. This general activities suggest how to assess a PLE. When a PLE is used in a formal course the assess has focused on what the learner perceives and thinks about their use during the course [11], [12], the ease and efficiency of use and the weighting of time spent on its construction [13]. Instruments that ask participants to express their perception of the PLE regarding used [14]; the possibility of application in other contexts outside of the subject in which the PLE was implemented [15]; and preferences regarding the type of format in which information can be used either audio, video or images [16].

When the PLE is used to fulfill a precise purpose within a course, explicit criteria are proposed for the activities, establishing specific tasks to each tool, if so, the duration of use of the PLE is limited. In this context, how to assess the results of the use of the PLE is focused on what the user to modify and customize it, for example, to quantify the frequency of use of tools or resources number of hits [14], [8], [13], explore by checklists, the number of tools used once instructed in the use of the same [11]; qualitatively discuss ways to use the tools to socialize information or to manage internet resources, considering differences and similarities between learners [17].

So we can see a variety of proposals for assess a PLE, but without providing a quantitative means related to the level of development reached in each PLE. Given this review, the present paper proposes an instrument to assess a PLE based on the above elements, based on a deep theoretical review and expert judgments. Starting with an expert interview and analysis with expert PLE users, which led to generate gradients criteria and performance of it to develop a rubric.

So the aim of this study was to develop a rubric for assess a Personal Learning Environment.

2 METHODOLOGY

2.1 Participants

Five users PLE experts. They were selected according to criteria such as the level of use of Internet tools, frequency of use and related to everyday work activities.

2.2 Instruments

- Format of semi-structured interview performed by expert PLE users.
- Format valuation criteria section.
- Sound recorder.

2.3 Procedure

We interviewed each expert in their workplace following the format of semi-structured interviews in which they were asked to show how they used Internet tools for learning purpose. Each of them was detailing the tools and their use while performing the interviewer questions to deepen a specific procedure.

The expert interview general structure follows these eight general steps:

1. Begin - Explain the general concept of PLE to the expert.
2. Objective – Say one objective to use a PLE.
3. Internet Tools – Show me the tools you use in your PLE.
4. General sequence – Is any tool that you use at first time, and use that information in another tool?
5. Core tool – Is there any tool that you think is de core or fundamental tool for your PLE?
6. Five main activities – Questions about add/search information, relate information, create information, share information and organize task and time.
7. Evaluate the tools – How you evaluate each tool to achieve your goal? How do you make the decision to add a new tool to your PLE?
8. Discarding tools – Can you give me an example of discarded tools?

Each of the interviews were recorded on audio prior consent of the expert and were later transcribed to a text version.

Content analysis of each of the interviews was done and categories were obtained, which were analyzed and became criteria and performance levels to compose the rubric.

Subsequently validating the criteria through the procedure called Content Validity Ratio (CVR) [18]. For it was again contacted those experts who were interviewed during the previous semester, but one that decided not to participate.

In a meeting with each of them they were shown the heading text document format with the criteria and performance gradients. This Assessment Panel Content [18] was composed of four judges who were given the following statement:

Dear expert judge: On the left side the name of the criterion and then the four performance levels that compose it. Please rate by choosing one of three options found under each criterion 1) Useful, if you think it is a criterion to be included in rubric; 2) Useful but not essential, if they

can be included but can be dispensed, or 3) it is not necessary, if you think that criterion should be omitted from the section. We appreciate your help with this project.

Then the proportion of validity of the following formula was calculated:

$$CVR = \frac{\left(ne - \frac{N}{2} \right)}{\left(\frac{N}{2} \right)}$$

Where *ne* is the number of panelists indicating that a criterion is "essential" and *N* is the total number of panelists. When less than half of the panelists indicated that it is not essential then the ratio is negative. When half of the panelists said it is essential and the other half no, the ratio is zero. When all panelists indicate that the criterion is essential then the ratio is one. When more than half of the panelists indicated that is essential, but not all, then CVR is a value between zero and 0.99 [18].

3 RESULTS

As seen in table 1 of the original 15 criteria, two had negative to be rated by two or more judges as "unnecessary" or "useful but not essential" (criteria 5 and 10) and two more scores obtained score zero to be evaluated by two judges as "useful but not essential". The criteria on which a consensus was obtained perfect and were rated as "essential" obtained a score of one.

Table 1 shows the 15 criterion of the rubric to assess the Personal Learning Environments and the scores obtained in the validation by judges.

Criteria	Essential	Useful but not essential	No need	CVR
1. Objective of the project to create and develop their PLE	4			1
2. Functionality of the PLE (add, connect, create, share and organize)	3	1		0.5
3. Ubiquity of PLE (using different devices)	4			1
4. Learning related to the project mediated by the PLE	3		1	0.5
5. Efficiency (time-benefit ratio) in the creation of the PLE	1	3		-0.5
6. Perception of efficiency in the use of PLE	4			1
7. Systematic use of PLE	4			1
8. Transformation tools PLE to perform functions (add, connect, create, share and organize)	4			1
9. Finding Information	2	2		0
10. Information Management	1	2	1	-0.5
11. Criteria for the choice of tools	4			1
12. Connectivity between tools	4			1
13. Collaboration with other users	3	1		0.5
14. Share information	2	2		0
15. Transfer to another context	3	1		0.5
Content Validity Index (CVI) - Average CVR				0.53

Subsequently the Content Validity Index (CVI) [18] is the average rate at which the criteria of the heading and level of performance in the domain of activity relate calculated. It is calculated by averaging the scores resulting from all criterion.

The CVI to remove negative criterion (without criterion 5 and 10) CVR is 0.69, for a total of 13 criterion.

According to the theory and the relationship between the activities developed in a PLE proposals [6] finding/search and share information are a key elements, therefore both criteria were maintained for this theoretical reasons.

4 CONCLUSIONS

The procedure proved to be robust to build and validate the rubric to assess a PLE and then to determine a level of development objective for these environments, which can give rise to other quantitative analysis, as correlations and linear regressions.

The CVR [18] and the expert panel proved to be useful tools that allow ambiguity rule over other methods of assessment of these environments in the literature for example based on perceptions and opinions of the students on the use of the environment [13], [11], [12], [14].

Following the guidelines of investigation methodology [19] on the one hand we know that this work gives us a solid base to assess a PLE from the good practices from the experts, achieved through these content validity. If this is taken into account and added to the theoretical review, and the contrast with the activities suggested about the authors (add, connect, create, share and organize [6], [4], [2], [9]) will be satisfactory level of validity. Further studies are needed to build parameters and achieve the criterion validity, that can be used to link scores between the rubric presented here and the performance of a learner to build and use their PLE to fulfill a purpose of learning are needed.

The work does not stop here, later we should perform the reliability of the rubric, which will close the procedure to be used in any context to assess a PLE, this will be done through a procedure using inter judges reliability.

For this method 5 examples of PLE are valued using the rubric, two raters conducting independent valuation will be required. Following suggestions for reliability consensus agreement [20] through which a percentage is calculated by adding the number of cases that received the same rating from both judges and dividing that number by the total number of rated by two judges cases. If 70% or more of consensus is obtained, then the rubric provides reliable data. Later Cohen Kappa coefficient is used to estimate the degree of agreement between two judges. Higher values are expected (up to .60) for the rubric can be considered a reliable instrument.

5 RESEARCH FIELD

The instrument (rubric) presented in this paper will be used to assess the PLE created from a workshop belonging to a further investigation since the possibility of autonomy in learning can be related to how arises apprentices establish their own objectives and goals, select and adjust their strategies, also with how to monitor their progress and reflect on them, under the vision of self-regulated learning. In addition, the challenge of using an unstructured environment as a PLE implies that the learner is positioned in a certain way with respect to knowledge, specifically in the search for information on problems without unique responses and assessment of different sources of information; is this positioning that will serve as a basis for setting its own standards to raise its objectives and goals, make decisions to meet its goal and manage uncertainty.

To find this relationship three online workshops were conducted, each with 10 weeks of work on a Moodle belonging to the UNAM in Mexico. The activities were designed following a instructional design model [21] using video tutorials to show the procedural content, specifically the use of the tools to build a PLE.

The workshop was held contemplating two phases, in the first phase general instruction was given on use of tools during 7 working units which looked tools that were used to perform essential activities in PLE, following the suggestions of the studies [6], [4], [2], [9] (add information, connect information, create new information, share information with others and organize time and task).

In the second phase of the workshop (4 weeks), the autonomous use of PLE was encouraged, without direct instruction. The final activity of the workshop was performed on a video through which participants described their PLE, the tools they used, devices through which they use to access to these tools and how these tools helped to achieve the learning objectives. It is this final product that will be assessed with the rubric presented here.

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