

Evaluation in Virtual Learning Environments

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Abstract: Different studies have been conducted involving the development of computational tools that can map the interactions that take place in virtual learning environments (VLE). These tools can help teachers in the evaluation process of the activities performed in the VLE, allowing the tracking of the student participation and production. This paper presents a reflection about the evaluation processes in virtual learning environments. In the first moment, the article presents a reflection about the evaluation process. After, it describes different tools that monitor the evaluation process. It is understood that this study may trigger a new understanding of the task of evaluating learning in distance education.

Keywords: distance learning, virtual learning environment, interaction, evaluation

1. Introduction

This paper presents a reflection about evaluation in virtual learning environments (VLE). Despite the diversity of the VLEs, it is perceived that they have a set of common characteristics such as restricted access to enrolled users, space for publishing professor's materials, space for storing student's assignments and many other synchronous and asynchronous communication tools.

The VLE allows the centralization of all online course materials. On the other hand, the management of this amount of information is under the responsibility of each participant. The professor, in this context, is faced with a tangle of information, diluted among different tools.

Different studies have been conducted (Roma, 2000, Lachi, 2003, Bassani, 2006) involving tool development for mapping the interactions, which allow the frequency and production monitoring of each student in order to make possible the online assessment. This paper presents a reflection about evaluation on the virtual learning environments and describes some tools that monitor the evaluation process in different VLEs.

This study adopts a constructivist-interactionist framework based on a piagetian approach (1973, 1975, 1983, 1994, 1995, 2003), in which learning is understood

as a process both individual and collective and the individuals cannot be defined if not in association with the elements of the environment.

2. Different perspective for learning evaluation in VLEs

There are several modalities of evaluation, characterized by the period/time in which they occur and by learning goals (Bloom et al., 1983, and Jorba Sanmartí, 2003).

The diagnostic evaluation takes place in the beginning of the learning process and provides information about the prior knowledge of the students.

Formative evaluation is generally carried out throughout a course and it allows the teacher to supervise the student during the course.

A summative evaluation emphasizes the results at the end of the process. Usually it happens at the end of the teaching-learning process in order to make sure that the objectives have been (or not) achieved by students. This modality of evaluation is very common in educational institutions. The biggest problem of summative evaluation is that in most cases, it is used as the unique source of assessment.

The virtual learning environments allow the tracking of the student's participation and production in different ways: frequency (access date and time), online tests, published materials, performed tasks (including the meeting of deadlines), and the messages exchanged among participants of a class/course (Bassani, 2006).

Therefore, evaluation in virtual learning environments can be understood from three perspectives (Bassani, 2006):

- a) online assessment;
- b) activities or individual production;
- c) analysis of the interactions between students based on the messages posted in different communications tools.

It is understood that an evaluation based only in online tests has limitations since the process doesn't include the professor's mediation. Therefore, the professor receives a final grade emphasizing the product of knowledge.

On the other hand, an evaluation based on student's individual production (i.e. an abstract, a paper, messages in a discussion forum) can also be done in order to overvalue the final product.

Becker (2001) emphasizes that evaluation should not occur only individually but also collectively. It is understood that an evaluation based on the interactions between participants in a distance course meets a new evaluative perspective, which seeks to evaluate the product in the process (Vasconcellos, 1998). Thus, in addition to enabling the teacher to monitor the process of building student knowledge it also enables the student to become aware of his learning process. However, how to evaluate based on interactions?

Bassani (2006) presents a proposal that deals with current trends in the learning evaluation area approaching product and process. In this study, the process is understood as the path of individual building, which arises from the interactions. Moreover, the product is the result of interactions, evidenced by the content of messages posted by a particular student in VLE. The proposed model covers the interactions in individual and inter-individual level.

The evaluation of learning in an individual level is centered on actions and results of the evaluated student and shows quantitative aspects related to the number of logins, given date/time of entry and exit, as well as qualitative aspects related to content of the posted messages.

The figure below shows the indicators for the evaluation of learning in an individual level.

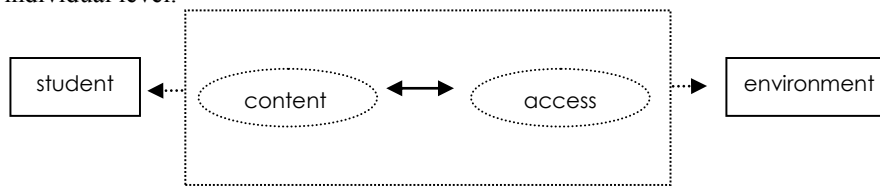


Figure 1 - Indicators for the evaluation of learning in an individual level.

The evaluation of learning in an inter-individual level focuses on the interactions between students who attended a course in the VLE. Thus, it is understood that the inter-individual interactions involve three complementary criteria: content of the message, exchange value and type.

According to Piaget (1973), the value of a proposition is directly related to the recognition by a colleague or partner, so that "the student α is valued by α' proportionally to the service provided "(1973, p. 121).

The exchange value comes from the effect that a message produces on the group, in which, the greater the number of messages related to the original message, the higher is its value. The message type refers to the characteristics of the posted text, which may be a comment, an answer, a discussion, a question or others. Thus, it is understood that the content, in addition to enabling evaluation parameters, will stimulate or not the interactions between students.

This way, in this approach the evaluation in an inter-individual level involves the interconnection between content, type and value, as shown below:

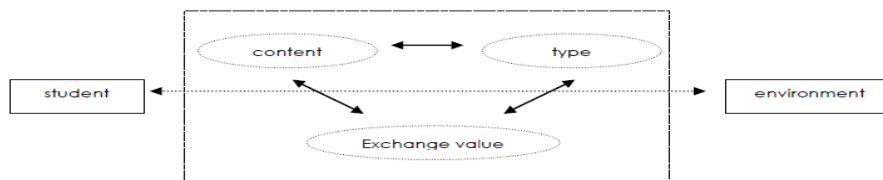


Figure 2 - Indicators for evaluation in an inter-individual level

It is understood that these indicators used for the analysis of the interactions in the individual and inter-individual levels are capable of promoting the evaluation of learning in a virtual learning environment.

3. Tools for monitoring the evaluation process in VLE

In this section we will present tools and/or modules of visualization of interactions among the participants of a distance course/classroom, already developed and in use in different VLEs: ROODA (UFRGS), Teleduc (UNICAMP) and Moodle.

3.1 ROODA

The virtual learning environment ROODA (Rede cOoperativa De Aprendizagem – Cooperative Network for Learning) is part of the studies linked to the project¹ “Development of virtual learning environments and methodologies for distance learning at UFRGS”, which are developed by the interdisciplinary group of NUTED² (Núcleo de Tecnologia Digital Aplicada à Educação - Faculdade de Educação/UFRGS – Digital Technology applied to education at the Education School of the Federal University of Rio Grande do Sul.).

The tool interROODA³ was developed in order to make possible the visualization of the interactions that happen in the virtual learning environment ROODA. It is composed by two complementary modules (Bassani, 2006):

- a) monitoring of access and frequency;
- b) interindividual exchanges.

The module “monitoring of access and frequency” presents quantitative data referring to presence in the environment ROODA, including accesses to the environment, accesses to the courses/disciplines and to the other tools, including access to texts/messages posted in each tool. This module focuses in actions and results of a specific agent, in this case, the agent that is being evaluated. Thus, referring to the evaluation in an individual perspective.

The control of the number of accesses and contributions allows the teacher make an evaluation based on the number of posted messages. However, in a evaluative proposal supported by the constructivist-interactionist paradigm, this criterion presents superficial subsidies for the evaluation of the learning,

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² <http://www.nuted.edu.ufrgs.br>

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contemplating only aspects linked to the participation in the proposed activities. Furthermore, an evaluation based in the number of messages posted presents limitations, because not always the quantity of messages is linked to the specific content of the discipline. However, the professor can use this information to accompany/check if the students are participating and to outline proposals of action/intervention. This way, the quantitative data enables a qualitative analysis.

The module “interindividual exchanges” approaches the evaluation from an interindividual perspective. The mapping of the interindividual exchanges intends to reflect the dynamic of the interactions that happen between the participants of a VLE. Thus, it makes possible to evaluate the development of the student’s learning, where each posted message can be analyzed not only by the content, but also by the integration with the other messages.

This module intends to map the qualitative exchanges in a Piagetian (1973) perspective, where it is understood that the value of a proposition (or posted message) is directly related to the recognition by another student. So, in this study, it is considered that the value of a proposition/message is directly related to the effect produced in the group and expressed by the number of interactions between the students. Thus, the tool interROODA presents the number of interactions linked to a message as a form of indicating its value.

In this module the teacher has access to all the messages of a participant, in determined topic of a discussion forum. Each message is classified as statement or quotation, according to picture 3. In this study “statement”(or enunciado) represents the messages that begin a new discussion (father-message) and “quotation” (or citação) represents the answers to a statement or to another quotation (son-message).

Tópico : Ferramentas disponíveis na Internet			
Ferramentas de Interação e Cooperação/Colaboração na Web U - Patrícia Bassani			
Data	Mensagem	Tipo	Interações
19/04/2005 15:00	Encaminhei pedido para teu cadastro nas demais oficinas. Abraço.	Citação	1
04/04/2005 19:54	O site http://www.clickgratis.com.br também oferece recursos interessantes, como fot...	Enunciado	0
04/04/2005 19:45	Testei teu fórum e funciona perfeitamente!	Citação	0
30/03/2005 16:23	Este fórum aceita tags ...	Citação	1
30/03/2005 16:22	Este fórum aceita tags de html? Vamos testar...	Citação	6
30/03/2005 11:21	Olá pessoal! Está abeta a discussão sobre ferramentas de interação e colaboração/coo...	Enunciado	0

Figure 3 – Interindividual exchanges

The tool interROODA facilitates the access to the messages posted in the AVA, making possible several types of search. This way, it enables both teacher and student to visualize different types of quantitative and qualitative data. The

modeling of this tool adopted a constructivist-interactionist approach. However the reading and the interpretation of the data presented by interROODA, can be done through different paradigms.

3.2 Teleduc

The Teleduc (<http://teleduc.nied.unicamp.br/teleduc/>) is a virtual learning environment developed by “Núcleo de Informática Aplicada à Educação (Nied)” and by “Instituto de Computação (IC) da Universidade Estadual de Campinas (Unicamp)”. Teleduc has a tool called Accesses, in which it is possible to check the “Report of Accesses” and the “Report of Frequency”. The Report of Accesses presents the number of accesses of each student or teacher and informs the date of the last access. The Report of Frequency allows the visualization of the accesses in each tool of the Teleduc, like mail, chat, bulletin board.

Teleduc also has a tool called Intermap for visualization of the interaction (Romany, 2000). The Intermap was developed to map graphically the interaction and the participation of the agents (teacher and students) involved in a course in the Teleduc.

The Intermap searches the data stored in communication tools (mail, discussion group and chat) and presents the results in a graphic called “interaction map”.

The interaction map (Figure 4) is represented by a graph, where the knots show the participants of the course and the linking lines show the messages.

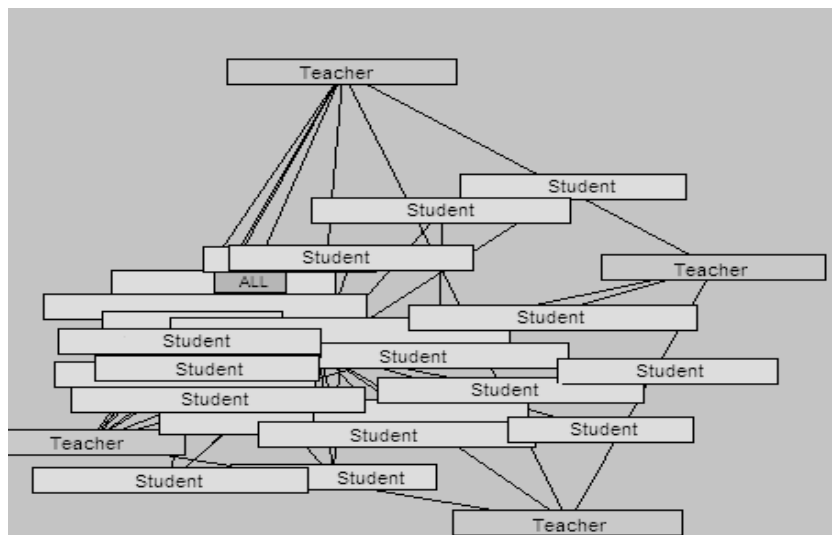


Figure 4 – Interaction map

Besides the interaction map, the Intermap has more two functions: graph and conversation flow.

The graph were implemented to show the number of messages sent in a period (day/month/year/week) and/or by category (all agents/students only/ teacher only).

The conversation flow shows the messages in a discussion group and in the chat, illustrating the messages sent by students and also the intervention of the professor. It is possible to access the content of each message and the student profile by clicking on his name.

3.3 MOODLE

The Moodle (<http://moodle.org>) is an open source virtual learning environment, which makes possible the tracking of the activities developed by the students, through reports of access.

Through this report the professor can track all the activities performed by the student.

The evaluation of the activities is registered through grades but the professor can define different values for each activity to compose a final grade.

The Moodle makes possible the visualization of the messages posted by a determined student without connection with other messages.

The table bellow presents the report of access in Moodle.

Table 1: Report of access in Moodle

Student	Evaluations					Total ↓↑	Student
	Activity 1	Forum - Activity 1	Activitye 2 - Part 1	Forum - Activity 2	Personal pages		
Order by surname							Order by surname
Order by name	15	10	15	10	50	100	Order by name
Student 1	15	10	12	10	48	95	Student 1
Student 2	8	10	15	10	50	93	Student 2
Student 3	15	10	11	10	50	86	Student 3

4. Final considerations

Considering the reflections in this article, we verify that a learning evaluation based only on the accesses and number of posted messages or in the message content, emphasizes the product and disregards the learning process.

However, the combination of these criteria can enhance the evaluation process in virtual learning environments, since it allows a new dimension of quantitative data. This way, the quantitative data aren't considered simply as an evaluation criterion, but as a possibility of pedagogic intervention.

So, is it understood that a ruled criterion of evaluation based only in the accesses and in the number of messages posted presents limitations, but the teacher can make use of this information to accompany/check if the students are participating and to outline proposals of action/intervention, with emphasis in a formative evaluation.

The evaluation in a formative perspective is based in the constant follow up of the learning process of the student, and in intervention by the professor, when necessary. In a VLE the professor can follow up the access (frequency) and the participation in the proposed activities.

It is understood that in the conception of the different tools presented in this paper there is a movement in order to map the interactions between the participants of an online course, making possible a formative evaluation. However, there is still a great field of investigation in distance learning evaluation, especially involving studies in interface and data mining.

Finally, it is understood that a study about interaction in virtual learning environments may trigger a new posture toward the task of evaluating learning in long distance education.

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