Teacher's Presence Mediated by Virtual Learning Environment Interfaces: Evidences of the *Self*

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ABSTRACT

This is part of a qualitative research to study the metacommunication practiced by teachers who deliver education through virtual learning environments (VLE). We are interested on traces or signs of expression, presence and representation of the teachers' selves as end-user developers of the interfaces they customize for their classes. For that, we chose Moodle as the environment to conduct this work and counted with the voluntary participation of nine teachers, all with different profiles concerning to the field of work and the educational model. Instead of observing these teachers on the construction of interfaces, we adopted a different approach by interviewing them and collecting their own impressions about the way they communicate through the VLE. It has been found that teachers practice self-expression and representation through VLE in three different ways: expression through written language, interface customization and through the content. These aspects are discussed and some points concerning to training and methodologies are raised.

Author Keywords

Semiotic Engineering; Self-Expression; Virtual Learning Environments; End-User Programming

ACM Classification Keywords

H.5.2 Information Interfaces and Presentation: User Interfaces

INTRODUCTION

Teaching-learning processes have profited with the diffusion of Virtual Learning Environments (VLE) not only in respect to distance education but also regarding to traditional (on-ground) classroom, where VLE is used to support extra-class activities. In this context, a teacher using a VLE in class has now an important additional task: to customize this interface for the benefit of his/her students. As a consequence, we understand that the way to customize it may influence the perception of teacher's virtual self-presence and assistance.

That said, the research presented and discussed in this article focuses on the question of how teachers express themselves from the interfaces made available in virtual learning environments. This is a preliminary result of a qualitative research, which seeks for traces or signs of *expression*, *presence* and *representation* of the *self* from the perspective of teachers as end-user developers of VLE interfaces.

Among the virtual learning environments available, we chose Moodle [11] for conducting the research, for it is a free and open-source software broadly adopted around the world. We counted with a group of nine volunteers, all experienced teachers with different profiles in respect to the field of work, education delivery mode and even target audience, since some of them work in college while others compose an education board within a corporation. These teachers were subjected to a questionnaire and then to an interview, from where we could record their own impressions and testimonies about their experience with Moodle.

We understand it is paramount for this study to build a background on some fundamental concepts on End-User Development [1, 7] and Semiotic Engineering [2, 9], which is done in the next section. These concepts will help to construct the basis to enable analysis and foster discussion. Section "Methodology" details the approach adopted for this research. In this section, the purpose of allying interviews to questionnaires is presented and justified. The Section "Data Analysis" was structured in two subsections: the first to describe the different educational models observed; and the second to present the most important testimonies, which are grouped into three ways of expressing the teacher's self – through written language, interface customization and through the content. The last two sections of the paper bring some additional insight by discussing complementary data and close the paper with final considerations and future work.

BACKGROUND

End-User Development (EUD)[1] is a broad concept which can be defined on the relation between scope of application and learning costs, as pointed by Fischer [7]. According to this

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[1] Along the text, we may refer to End-User Programming (EUP) as a synonym of End-User Development (EUD), and in the context of this work they are the same. However, the concepts subtly differ in a more rigorous analysis [6].

discipline, a simple software customization (or personalization) to meet and accommodate a specific user's requirement can be considered programming, in a more relaxed sense.

To illustrate the extent of this concept, Fischer [7] presents a diagram where scope of application and learning cost are plotted as independent dimensions, both evaluated in high and low levels. This exercise leads to a four quadrant diagram where we could distribute the various kinds of programming practiced by end-users. Figure 1 shows a slightly simplified version of the diagram presented by Fischer.
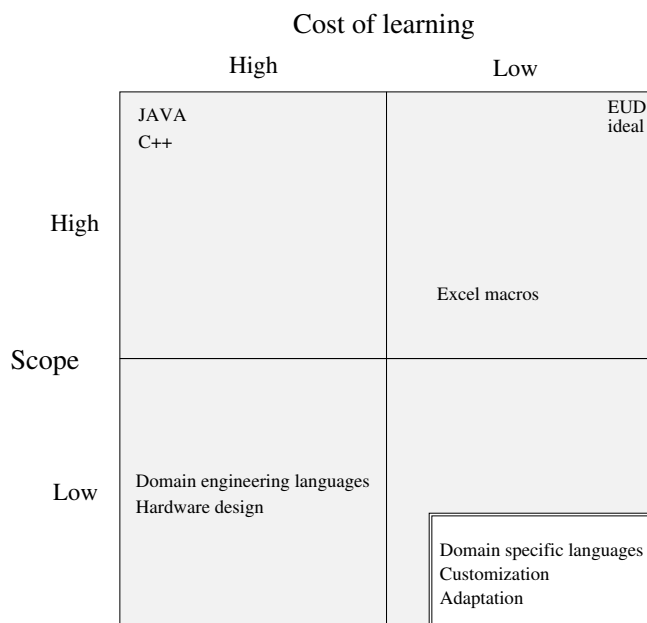
Cost of learning

Figure 1. Adapted from Fischer's paper on Meta-Design [7].

Concerning this figure, some programs developed in Java or C++ lay upon the high learning cost but bring great value by enabling the user to produce software in a wide scope, for different purposes and expectations. Hardware design and component programming would fall into the high learning cost but in a narrower scope, since this kind of development uses to be highly specialized. Low cost and low scope is the quadrant reserved for customization, personalization and alike, while spreadsheet programming by means of macros falls in the ideal quadrant for end-user programming, where the cost of learning is relatively low but the scope of application is quite wide.

In what concerns to this research, we are interested in the ways teachers compose or arrange the interface of a virtual learning environment for the benefit of their students, looking for traces of the teacher's self while developer of his/her own classes in a distance learning context. As so, from the EUD standpoint, this research falls into the low-low quadrant of Figure 1, since it is about customization more than anything else, where teacher occupies the role of end-user developer, being the student the consumer of his/her product.

To this point, we used "customization" and "personalization" to address the same idea, without the care of a formal definition, which is now opportune. Personalization, according to Blom [1], is "a process that changes the functionality, interface, information content, or distinctiveness of a system to increase its personal relevance to an individual".

Blom also defines Customization as a special case of personalization, where the process is initiated by the system instead of the user. As for example, customization is performed during software installation, when the system asks for personal information to adapt itself to the user's needs. Marathe [8], on the other hand, don't even talk about personalization, sharing the same viewpoint of Wells [13] in this matter. According to Marathe, "Customization is characterized as a user-centered and user-initiated activity and defined as the 'deliberate decoration or modification of an environment by its occupants'[13]".

In spite of Marathe's definition for customization being the one most commonly adopted, Blom [1] provides a more profound reflection about the reasons why to personalize an interface, proposing a "framework for thinking about personalization", which states they are categorized into work and social related motivations. The subcategories of work related motivations are: to enable access to information content, accommodate work goals and accommodate individual differences.

In the context of this research, we focus our attention in the category of social related motivations, whose subcategories are: eliciting emotional responses and expressing the identity of the user. We do so, since they bring up the ideas of self-presentation and social identity, which shares with Semiotic Engineering the same interests, as follows next.

As defined by Souza [2], Semiotic Engineering (SemEng) refers to semiotics applied to Human-Computer Interaction (HCI), giving a new perspective to the discipline by changing the focus from the interaction between human and software interface to a new point of view where the conversation between user and software designer takes place, supported by computer mediation. Note that when we talk about user-designer communication we are not implying this happens in real time nor that it is explicit. In fact, this communication is implicit and happens by means of one-shot message – a sufficient and self-contained message – directed from designer to user. This message is rich in metacommunication explaining the designer's intent with the software s/he produced for that specific user, as well posed by Souza [5] in this excerpt: "Here is my understanding of who you are, what I've learned you want or need to do, in which preferred ways, and why. This is the system that I have therefore designed for you, and this is the way you can or should use it in order to fulfill a range of purposes that fall within this vision". As such, it is sustained that one-shot message promotes the designer's virtual presence by means of expression through the software, which acts as the designer's deputy in the communication with users.

In the context of this work, we blend together the concepts of End-User Development, Customization/Personalization and Semiotic Engineering to uncover and study signs of virtual

presence and self-expression through the interface of a virtual learning environment, where teacher customizes the classes and, by doing so, maybe inadvertently, sends one-shot messages to the students, which are the consumers of the product created by him/her in the role of end-user developer. Works in similar subjects have been carried out by the creators of the Semiotic Engineering theory [4, 9, 3]. Monteiro's article [9], in particular, is focused on capturing the expression, presence and representation of the teacher's self while configuring, customizing and programming a web navigation script for the benefit of his/her students. This script is created by using the Web Navigation Helper (WNH) [9, 10], a tool for enabling guidance to improve one's web navigation experience, in this case, teachers improving the students' navigation experience. However, despite the similarity, our work is focused on teacher's own perception concerning his/her self-expression, presence and representation through the interface customized by him/her, being this research data collected by interviewing teachers and recording their testimonies, instead of by observing them on their activities.

METHODOLOGY

Given the focus of this qualitative research – which is how the teacher expresses himself/herself from the interfaces at his/her disposal –, among the virtual learning environments available, we chose Moodle [11] (acronym for Modular Object-Oriented Dynamic Learning Environment) for conducting our work, since it is free, open-source and widely adopted [12]. Moodle is also completely customizable, making us to believe it is suitable to accomplish the goal of understanding and discussing the ways of expression practiced by teachers.

Once chosen the VLE, we decided to work in an exploratory case study with few participants and longer interviews, looking for more sound information for a better qualitative analysis, giving this research a good start. In this context we relied on the voluntary participation of nine teachers, according to Table 1. We seek, through analysis, to answer the question: "How the teacher feels himself/herself represented through Moodle?". This is a broad question that encompasses feelings regarding representation, expression and presence, having Moodle as an intermediary interface between the teacher and his/her students.

As posed, it is possible to recognize this situation as a case of human-computer interaction where a software – Moodle – is used as the mediator in the communication between humans. Therefore, this places our research within the small group of communication-centered investigations interested on semiotic aspects of communication through software interface, since most of investigations presented on formal HCI venues on this subject relies on social sciences such as psychology, as noticed by Monteiro *et al.* [10].

From the methodological point of view, the research was divided into two stages: the first was the application of a structured questionnaire with 24 closed questions and 3 open-ended questions; the second stage consisted of a semi-structured interview comprising 7 open questions.

The questionnaire was arranged in the following sections: Personal Profile, Teacher's Profile, Traditional (On-Ground) Classes, Distance Education. The first was intended to gather information such as length of experience, practice area, age of the respondent. The second section consisted of two parts: the first asked the teacher to choose among the available options the one that came closest to what he considered to be the ideal teacher's profile in respect to group or individual attendance; in reference to this question, the second part of this section asked the respondent to take a position and discourse about how he felt in regard to the profile which according to him was ideal. The aim of this section was to promote an early reflection on how the teacher communicates with the student in a broader way, not necessarily in the context of distance education, but in all his/her activities. The third section aimed to deepen this reflection by capturing elements to help the teacher to rescue his/her impressions on the teacher-student relationship in the classroom, where the teacher has the role of knowledge mediator, working closely to the student in his/her activity as an educator. The fourth section, related to the virtual class, was the most important in the questionnaire, for it was concerned to distance learning supported by the Moodle platform. However, even in this section, composed of closed questions, the objective was to generate reflection and prepare the teacher for the interview.

The interview was conducted preferentially in person, but some were carried out by video or by chat depending on the possibilities. It consisted of a guideline with 7 open questions, helping interviewer to keep focus while gave the interviewee freedom to openly discourse on the subject, exploring and raising related issues emerged during the process. These were the questions: (1) In what extent do you manage to execute your role via Moodle? (2) Are you able to express yourself? How? (3) What on the interface hinders, promotes or could promote the expression? (4) Have you ever thought of Moodle as a medium for self-expressing? What is the better way to do it? (5) Do you feel present on activities proposed by yourself? (6) Does Moodle represent you? (7) What is missing on Moodle? Note that the questions demanded a new reflection on teacher's profile at the light of distance learning via Moodle, seeking for clues about how teacher expresses himself/herself through this interface and what in it hinders or promotes this expression; they asked the teacher to manifest about feeling present and represented or not through the interface.

In a nutshell, the strategy presented here was to use the questionnaire to promote an initial reflection on the teacher's experience, both from the point of view of traditional (on-ground) classes and distance education, and then to deepen with open questions proposed in interview. As a result, the multiple choice questions in the questionnaire, caused some conflict on those teachers undecided between one alternative and another, as for example: must the teacher focus efforts on the group or on each student, providing personalized attendance? Despite the answer to this question is not particularly relevant to this research, it led to reflection on the teacher's innermost feelings about his/her role, and questions of abstract nature like this frequently lead to some kind of conflict for be-

ing difficult to provide a precise answer. This was expected, for we understand that putting the respondent in a conflicting situation makes him/her reflect more about the questions and, in the context of this research, would be better prepared to the interview, which in fact was verified.

DATA ANALYSIS
During the two stages of this research – questionnaire and interview –, we collected a large amount of data, some of them very direct, which we could capture in Table 1, and some more subjective, regarding the teacher's perception about his/her own self.

The distinctive nature of these data suggested us to divide this section into Categorization and Testimonies, organizing the thoughts for a better analysis activity.

Categorization
Looking at Table 1, we see at least three possible categorization criteria. The first in respect to the field of work, where T1, T3 and T9 present a more technical profile, contrasting to the humanities profile tendency of the remaining teachers. A second criterion concerns to the education modes: not only distance education and blended learning modes can benefit from using Moodle as an education environment, but also the traditional (on-ground) classroom, which may dispose of Moodle as an accessory tool. The last category we consider is related to the target audience: higher education and corporate education students. Most of the volunteers we interviewed are teachers associated to college or higher education, while others make part of a corporate training program, teaching employees and external entities about the corporation subjects.

Different combinations of these categories may give place to educational models whose structure differ not only on what concerns to the target audience but also in respect to the education mode adopted, as for instance, distance education in opposition to blended learning and on-ground education delivery modes. In compliance to these aspects, we identified in this research four educational models where Moodle figured as the virtual learning environment.

The corporate educational model is built as a two-stage process involving two different sets of roles. The planning phase counts with a team of experts, which is responsible for producing the course content, its structure and planning in terms of dates and activities. The execution phase counts with a team of tutors and technical tutors, responsible for carrying out the course, advising the students during the learning process and addressing their questions and concerns. Usually, the role of technical tutor is held by an expert from the former phase. S/He is responsible for supporting the tutors in their activities by answering some questions on the content about which the tutor has little or none knowledge. In addition to these roles, there is the technical staff which persists across the stages, being responsible for giving the content the correct design format in accordance to institutional standards, making the course available via Moodle and solving technical issues brought up by teachers and students concerning the platform usage.

In universities, we observed three distinct educational models: one supported by the roles of teacher, tutor and technical staff; other in which the role of tutor is not present; and a third counting only with the role of teacher. In the first model, the teacher is responsible for preparing the class and assisting the students on their learning process, while the tutor is given the responsibility to answer the technical issues about the use of Moodle and some minor and straightforward questions regarding the subject tutored by him/her. In the second educational model, the teacher absorbs completely those which would be the tutor's responsibilities, being necessary for this model to be employed in classes with a small number of students in comparison to the previous model. In both models, the technical or auxiliary staff has basically the same attribution: to publish the content inside the Moodle, as required by the teacher, giving the necessary layout in accordance to the institutional design patterns.

The last educational model is solely composed by the role of teacher, which is responsible for blended and on-ground classes within the college. For not counting with an auxiliary staff for giving format to the content and making it available on Moodle, the teacher uses to absorb this function too, making his/her task significantly more difficult, according to some testimonies.

Testimonies – Evidences of the Self
While conducting this research, we collected the teachers' impressions in respect to the way they communicate with their students via Moodle. We present in this subsection only those most significant for this article, along with an analysis under the context of our research. These testimonies are, therefore, taken as signs of self-expression and self-representation, characterizing the teachers' presence through the interface. Interestingly, as we are going to see next, during the analysis we identified that teacher's expression may happens by different means: through written language, interface assemblage and by means of the content itself.

a) Self-expression through written language
By reviewing the teachers' answers to the questionnaire, we see that the only activity to which all the interviewees engage in is the Forum, which is the most common way to allow participants to have asynchronous discussions. The interaction via forums happens mainly, but not exclusively, through writing, and its importance was reinforced by every teacher during the interview.

As presented in Section "Categorization", the corporate educational model presented in this research is very restrictive, with little flexibility to self-expression through customization and content making. In spite of frequently occupying the role of expert in the corporate training courses, when asked about how she could personalize Moodle, T2 put herself in the role of tutor, case in which the expression happens through the use of forums, messages, chats and alike: "*I think of the moment I attend the student while in the role of tutor. I have my way to express myself and my face is there; through my language I show myself to others. This is so true that [...] people think I am an extremely serious person, because the way I express*

Teacher	Field of Work	Teaching Experience		Distance Education	Blended Learning	On-Ground Education	Target Audience
		Total	Moodle				
T2	Law, Public Law	15 years		✓	–	–	Corporate Education
T6	Public Administration	20 years	5 years	✓	–	–	
T8	Business and Accountancy, People Management	25 years		✓	–	–	
T1	Computer Science, Parallel Computing	15 years		✓	✓	✓	Higher Education
T4	Computer Science, Informatics on Education, Psychology, Distance Education	33 years		✓	–	✓	
T5	Informatics on Education, Distance Education	18 years	7 years	✓	–	✓	
T7	Economy, History of Economy	25 years		–	✓	✓	
T9	Mathematics, Computer Science, Mathematical Computing, Scientific Computing	28 years		✓	✓	✓	
T3	Computer Science, Software Engineering, Human-Computer Interaction	3 years	1 year	–	–	✓	

Note: teachers are numbered according to the order they were interviewed.

Table 1. Teachers' profile according to their overall experience with Moodle (current and past). Except to T3, all of them are currently using Moodle to deliver education through one or more of these education mode: distance education, blended learning, on-ground education.

myself by writing happens in a very formal language. This is my face. Then when you ask if I can [express myself] and in which way, well, this is my face. I show myself to people through what I write".

When interviewing T4, we proposed a reflexion about the corporate educational model seen here, explaining the different roles and asking how she would feel in the place of a tutor in this model. She said "*[...] I think I would bother myself a little in receiving things already done, without the flexibility or the possibility to change something. But this you partially overcome by interacting with the students, through messages, while participating on forums, in the way you lead a chat... then you are present there*". This meets the point advocated by T2: the teacher can always express himself/herself while writing, by using the tools the virtual learning environment makes available.

Also, according to T8, the educational model adopted may impact in the self-representation. She thinks it is complicated to self-represent "*mainly when you didn't participate on the construction of the course*", but yet it is possible. She said "*you leave messages, you open a forum and put something in... I think this is the way we may be effectively present*". And this is another testimony that converges to the same idea: it may be difficult, but it is perfectly possible to self-express and self-represent through the way you write. T8 believes the way one writes is important and carry a lot of the self. While interacting on Moodle, she said she uses to "*write a message, place an image, something to print my personality*".

b) Self-expression through interface
Even though teachers may not be aware of it, we noticed that they also use interface elements to express themselves and this is done by customizing Moodle to meet some personal needs or desires. The impressions we collected from teachers show that personalization has motivations related both to work and social aspects, in accordance to Blom's categories [1] (see Section "Background"). The highlighted aspects here are: personalization as a way to enable access to information and a way to express identity. In fact, ultimately the teacher expresses his/her identity most of the time, since enabling access to information is probably done differently from teacher to teacher. We received from T6 an enthusiastic testimony in this regard: "*Indeed, the designer and others components of the assembling team should put the course together only from the content, [...] but we observed in the first courses that just the content was not sufficient, it was necessary to work with the designer, side by side, to make the course have our face and our way, and it was a success!*".

For T4, Moodle is a "*white panel*", where you can organize everything as you wish, giving your personal touch. To take a better profit of this, she asked a trainee to develop some special labels and icons for her to use and better characterize the sections within her Moodle area. She believes it is possible to personalize the interface and she tries to do so "*by coloring the sections, dividing by modules, using labels and icons*". The way she organizes her area on Moodle privileges a higher control over the class, using customization to develop trust and improve the relation between her and the students. Everything is done through Moodle, including email exchange. She says this way is possible to keep track of everything: "*I have the student's history and he has my history with him*".

But the customization alone is not effective: the teacher must help the student to understand the interface s/he creates for him. At least this is T5's opinion, who says the teacher must have "*a criterion like 'see, people, I always gonna put this bellow', 'I always gonna put that above'. The teacher has to*

say which is the logic, otherwise the student needs to guess where the things are". Therefore, customization is a great way to express and represent oneself through virtual learning environments, but instructions are always welcome in order to put everybody on the same page.

c) Self-expression through content
Depending on the context in which the teacher finds himself/herself, self-expression may be limited due to interface pattern restrictions and the need to employ jargons or some formality in the written language. This is the case for those interviewees working as teachers in training programs of a corporation (see Table 1). As seen in Section "Categorization", the observed corporate educational model is built as a two-stage process. The first phase is dedicated to the content planning, and the teacher may engage in it or not depending on whether s/he is an expert on the subject. After that, in the execution phase, tutors cannot change the content or organize the interface differently, as observed by T8: "*[...] we give the content, tell how we want it to be presented, we give tip, get animation, look for figure to illustrate. We help on the construction in the moment people are working on this configuration. But after it is ready, we cannot do anything more. We must use what exists*".

This statement points out there is a way to be present, a way to express oneself, by helping on selecting and organizing the content, during the first phase of the process. As this phase counts on a team of experts, it raises another question: how to personalize the interface if the content is made by a group? But from testimonies, it is possible to realize the self is preserved within the group, as we see by this other statement from T8: "*when you build [the course], when you do the step by step, you manage to show yourself more, to be more direct, more straightforward, and to put your expression in that course. Then, there were many [courses] whose construction we participated [...] and I think they have much our face, [...] people who know us also know right away 'oh, this has everything to do with So-and-So' [...]*".

When asked whether having a Moodle designer causes to loose the strength of teacher's expression in the class, T6 said: "*It doesn't loose our way, for we elaborate the content and send to the school arranged as we want [...]. The designer just applies the format*". This reinforces the idea of self-expression trough selecting and organizing the content.

As we see, even in a so restrictive educational model where the teacher cannot adapt the course as s/he wishes, there is a way to be effectively present, and this is by creating the content. Teacher T2 goes further and states that whichever the educational model followed, "*if you develop the content, if the class is yours, you gonna put your personality in this class, be present or not, be the class traditional (on-ground) or not*". According to her, the way one creates the content reflects the way of thinking, and this can be a sign of self-expression through content.

DISCUSSION
The question we try to answer with this research is how teachers feel they represent themselves through a virtual learning environment (VLE), for example Moodle. In this sense, we look for testimonies highlighting traces or signs of self-expression, including those from the perspective of teachers as end-user developers of virtual learning environment interfaces. In Section "Testimonies – Evidences of the Self" we present some testimonies collected from teachers who volunteered to participate in this research. Only the most significant statements where selected, looking to answer the posed question. But now we would like to bring this discussion to a somewhat broader context, evaluating not only how the expression affects the teachers' representation through the learning environment – which is the main subject of this research –, but also how this representation is impacted by other factors, such as the chosen educational model and mode, different audiences, methodological and training issues.

Note, however, this discussion is based on the interviewees' testimonies solely. It is beyond our scope to enter in discussions about the merit of these observations. The objective here is to foster research on particular points we understand may impact on teacher's expression through virtual learning environments and, therefore, his/her self-representation.

We start by defining Moodle – the environment we chose to conduct this work – from T4's perspective: "*Moodle is a big empty space that you can compose, where you gonna choose what to publish, in which order you gonna publish, and how you gonna work with that. It is a white panel*". In this sense, Moodle is suitable for complete customization, favoring the self-expression. However, when asked about its usability, whether a novice user would easily understand how to use Moodle, T4 answered s/he would "*not even know from where to start*". This may explain how T3 (novice user) feels about Moodle, which agrees that training is required, constituting the first barrier we observed, since teachers complain about the lack of adequate training. T9 reinforces this idea by stating that Moodle is a specialist system, requiring too much training and effort.

According to T4, even with adequate training customization is still a great barrier, since all the interface is adaptable, and maybe that is the reason why many teachers think it is too complicate and hard-working: "*you have to choose everything*". But T5 added to this a pertinent point: according to her, when talking about distance education, "*the teacher is responsible for producing the content and interacting with the students, confer grades, correct works... But you [the teacher] have an auxiliary team which will give it a format. The teacher from blended learning education don't*". And here we have a clear distinction concerning to the education mode adopted and its impact over the self-presence: teachers involved in blended learning education must be Moodle specialists in order to really take profit from customization. But this is a time-consuming task that most of them do not cope with.

Now it is important to understand there are multiple ways to implement blended learning mode. Teacher T9 said that the university leaves each college free to implement up to 20% of its curriculum on distance education mode. While some colleges implement 20% of the disciplines in distance education,

others implement 20% of each discipline in blended learning, and in between we have multiple shades of it. This may explain why teachers differ so much on the level of satisfaction regarding to the use of Moodle.

When asked about possible difficulties on using Moodle, teacher T1 showed concern about methodological issues. He feels teachers are not prepared to use distance education environments, as we see from this testimony: *"then you say 'oh, here is the lesson' [refering to the lesson module], yes but how I connect this to my class in a way that makes sense, that generates something, you know? This is much more difficult than the tool itself. The tool doesn't represent that"*. This testimony raises another question: in what degree does the lack of methodology while teaching through a VLE affect the ability to express the teacher's self? This question points that we need to further research on methodological strategies if we desire to improve the self-expression through VLEs.

FINAL CONSIDERATIONS

With this work we initiated a discussion on how teachers express and represent themselves through the use of virtual learning environment interfaces. Nine teachers were interviewed and the most significant testimonies were presented in this paper. We found signs of expression that highlight three ways to express oneself by the interface: through written language, through the interface customization, through content. We understand these evidences of self-expression as a sign of self-representation, where the virtual learning environment acts as the teacher's deputy in the communication with his/her students. Most of all, we believe that the self-representation impacts directly on teacher's perception about his/her presence by the students, as we may observe by the testimonies.

Another important consideration to bring to the discussion is placed as follows: if the teacher comes to understand that s/he is able to express himself/herself by the customization performed on Moodle, and that it has impact on the communication between himself/herself and the student, then this teacher may consider in looking for alternative and more efficient ways to promote this kind of communication, looking for different ways to make himself/herself even more present by his/her expression through customization. This indicates that new methodologies may naturally emerge from this understanding of the impact of customization in conversation with the student, creating, perhaps, a set of good practices on End-User Programming for distance learning.

Future work includes executing the analogous research by interviewing the students, in order to collect the points of view of both interlocutors (teachers and students) of this communication mediated through Moodle.

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