



Artigo

## DEVELOPMENT OF A VIRTUAL LEARNING COMMUNITY FOR THE INSERTION OF BLENDED LEARNING METHODOLOGY IN BASIC EDUCATION

*Alexandre José de Carvalho Silva<sup>1</sup>*

*Ronei Ximenes Martins<sup>2</sup>*

### ABSTRACT

This paper presents the development of a virtual learning community called Landell and based on the ADDIE model of analysis, design, development, implementation, and evaluation whose objective is to foster the use of virtual learning environments in basic education. A set of guidelines in the form of MOOC (Massive Open Online Course) was designed so basic education teachers can take advantage of the different educational uses of tools and resources available, ways to set up virtual learning spaces, and examples of teaching sequences to offer subsidies for incorporating the Blended Learning methodology into school activities. Various audiovisual aids were produced, and various learning objects and educational use programs were organized and displayed to enrich and broaden the possibilities of educational activities using the community developed.

**Keywords:** Educational technology. Hybrid Learning. Teacher training. Virtual learning community.

### RESUMEN

Este artículo presenta el desarrollo de una comunidad virtual de aprendizaje, denominada Landell, con base en el modelo ADDIE de análisis, diseño, desarrollo, implantación y evaluación, cuyo objetivo es fomentar el uso de ambiente virtual de aprendizaje en la enseñanza básica. Se ha elaborado un conjunto de orientaciones en la forma de MOOC (Massive Open Online Course); para que profesores de la enseñanza básica puedan utilizar los diferentes recursos pedagógicos de las herramientas y recursos disponibles, formas de configuración de espacios virtuales para el aprendizaje, ejemplos de secuencias didácticas buscando ofrecer subsidios para la incorporación de la metodología Blended Learning en actividades escolares. Se produjeron diferentes recursos audiovisuales y organizados, indicando varios objetos de aprendizaje y programas de uso educacional con el objetivo de enriquecer y de ampliar las posibilidades de acciones educacionales utilizando la comunidad desarrollada.

**Palabras clave:** Tecnología educacional. Educación bimodal. Formación de profesores. Comunidad virtual de aprendizaje.

<sup>1</sup> Universidade Federal de Lavras. E-mail: alexandresilva@ead.ufla.br

<sup>2</sup> Universidade Federal de Lavras. E-mail: rxmartins@ded.ufla.br

## RESUMO

Este artigo apresenta o desenvolvimento de uma comunidade virtual de aprendizagem, denominada Landell, com base no modelo ADDIE de análise, design, desenvolvimento, implementação e avaliação, cujo objetivo é fomentar o uso de ambiente virtual de aprendizagem na educação básica. Foi elaborado um conjunto de orientações na forma de MOOC (Massive Open Online Course) para que professores da educação básica possam acessar os diferentes usos pedagógicos das ferramentas, os recursos disponíveis, as formas de configuração de espaços virtuais para aprendizagem e os exemplos de sequências didáticas, visando oferecer subsídios para a incorporação da metodologia Blended Learning em atividades escolares. Foram produzidos diversos recursos audiovisuais e organizados e indicados vários objetos de aprendizagem e programas de uso educacional visando enriquecer e ampliar as possibilidades de ações educacionais utilizando a comunidade desenvolvida.

**Palavras-chave:** Tecnologia educacional. Educação bimodal. Formação de professores. Comunidade virtual de aprendizagem.

## 1. INTRODUCTION

Major fast changes to society can be seen taking place nowadays, and this transformation process is structural, multidimensional, and strongly related to Digital Information and Communication Technologies (DICT) (CASTELLS e CARDOSO, 2006). One of the changes taking place is the use of typical distance education technologies in contexts not restricted to distance education. Schools have been increasingly seeking to get hold of these DE tools to use them in classroom-based education as well (MORAN, 2014). This action dubbed blended learning may soon become the prevailing education model through the integration of classroom-based and DE models and convergence in all fields and

areas, from buildings to the production of educational resources (PRETTO, 2011).

The term blended learning, which considers the convergence between virtual and face-to-face components in education (TORI, 2010), may be seen as bimodal education, combined learning, semi-online education, or hybrid education, as its essence blends elements of face-to-face learning and internet-mediated learning. Essentially, it seeks to adjust and/or adapt distance and classroom-based education to each other, as well as incorporate new tools and bring different pedagogical methods and approaches into the mix (RODRIGUES, 2010). As noted by DeBettio et al (2013), through this convergence of education forms it is possible to create different teaching models depending on the technology, methodology, and pedagogical approach adopted, which requires redesigning conventional face-to-face programs. The model to be adopted must be defined by students' needs and the contents to be discussed.

Hence, through the use of virtual learning environments (VLEs, which are computer systems developed for managing internet-based teaching and learning activities), it is possible to build virtual learning communities (SCHLEMMER, SACCOL, and GARRIDO, 2014). Such communities comprise teachers and students who may be intensely and permanently active via successive interactions, regardless of their geographical location (PRETTO, 2011). Based on that, we can say they allow (BELTRAN LLERA, 2007): (a) students and teachers to meet (again) beyond the confines of the classroom; (b) community members to take their time thinking before answering and interacting as they discuss concepts or building arguments; (c) facilitated access to the contents worked on by teachers; (d) everyone to follow the track of individual and collective rationales.

Studies into blended learning-type courses, such as those by Carvalho Neto (2009) and Martins et al (2011), found Brazilian students had a positive opinion of them, as students believed it was relevant to use VLEs as support for classroom-based education and as a repository of contents. A high number of them planned to use this resource in future professional activities. Such results indicate that developing the Landell Community<sup>3</sup> may help increase learning opportunities in basic education.

Because the use of virtual learning communities, and especially the use of blended learning, is still something recent, it is necessary to look into the application possibilities and results of this model of education. One way of investigating this practice is to monitor how a knowledge area develops by analyzing its scientific production, considering this is an interesting way for detecting the prominence of certain topics and pointing out growth paths and improvements for others (TEIXEIRA, SILVA, and BARDAGI, 2013).

With respect to that, in an effort to obtain inputs for developing the Landell virtual learning community<sup>4</sup>, a descriptive and exploratory investigation was conducted (GIL, 1991), including a documental analysis and a comparative study (TEIXEIRA, SILVA, and BARDAGI, 2013). To do that, we reviewed the literature and looked into communities specializing in VLEs. We also looked into VLE use in classroom-based education, focusing primarily on papers related to basic education.

We went to the CAPES journal website and Google Scholar, where we searched for articles dated 2009 to 2014 which discussed VLE evaluation and/or use in classroom-based education. The results showed a

prevalence of international publications, and a higher rate of papers related to higher and corporate education. Few papers and studies on basic education were found. As for studies conducted in Brazil, only a few were found, and most of them look into teacher training in semi-online courses. When we pointed our search to the use of blended learning in Brazilian basic education, the number of publications found amounted to a mere nine. However, only the paper by Giraldo and Isaza (2011) was directly related to the subject of this study. Detailed information on this literature review can be obtained from the thesis by (SILVA, 2014).

In addition to our literature review, we conducted a comparative study based on research on currently available open-code VLEs whose benefits include updated features, easy setup, and developer community service and support (ABERDOUR, 2007). We chose VLEs that had versions in Portuguese, in order to make them easier for basic education teachers and students to use, were updated by developer communities or project managers, and were free. The results from our analysis and comparison between the systems pointed Moodle out as the most suitable for use in classroom-based basic education. Detailed information on the VLE analysis phase can be obtained from the thesis by (SILVA, 2014).

After establishing the state of the art and the VLE to be used to create the virtual learning community, we proceeded to develop the Landell community in order to organize contents on VLE use featuring instructions for the use of tools, resources, setting up virtual rooms, and teaching sequence (TS) examples. TSs are a set of instructions on planned activities that gradually increase in difficulty and are guided by an overall topic or goal (MACHADO E; CRISTÓVÃO, 2006). The purpose of creating the community is to give teachers the opportunity to train in the use of VLEs in

<sup>3</sup> Name given to the virtual learning community put together in this study.

<sup>4</sup> The virtual learning community was given this name as a tribute to Brazilian researcher Landell de Moura.

basic education and provide, free of charge, virtual rooms for teachers to use with their public school students.

Once the phase of literature review and investigative studies necessary for designing the intended virtual learning community was completed, we moved on to development, whose description is the subject of this paper.

## 2. METHODOLOGY

The environment was created based on the ADDIE (analysis, design, development, implementation, evaluation) model, which is a widely used instructional design model (FILATRO, 2008).

Moodle was installed by an IT technician, and the Master's candidate set up the community and developed the materials under his advisor's supervision. The development phase lasted approximately three months.

## 3. DEVELOPMENT REPORT AND PROCESS DISCUSSION

This report describes the actions carried out in each of the ADDIE model phases (FILATRO, 2008).

### 3.1. ANALYSIS PHASE

In the analysis phase, the following requirements necessary for building the Landell Virtual Community were set:

a) The reference literature that supports the organization of training materials and elements found in the learning community;

b) Moodle installation, in this case its version 2.7, as it is stable and has solved some issues found in earlier versions;

c) The interface type, which should be simple so beginners could easily use it;

d) Definition of the Moodle tools to be made available for users (web page, forum, assignment, and labels);

e) Course designed in MOOC format;

f) MOOC design, featuring few interaction resources to keep user dependence on tutors to a minimum, releasing the availability of the class training course, and setting beginning and end dates.

### 3.2. DESIGN PHASE

In the design phase, the visual identity for the virtual community and study materials was created. The visual identity design was inspired by the voice transmission made by Brazilian researcher Landell de Moura. The virtual community's organization categories were defined as well, i.e. the navigation places available in the community, namely: (i) MOOC: VLE use in Classroom-Based Education, which is the course about how to use VLEs; (ii) Learning Spaces, where teachers can create their virtual classrooms; (iii) Sharing Experiences, a forum where the community can talk about VLE use, and (iv) Virtual Library, which stores several resources, such as video and shows, capable of enhancing the virtual classrooms. The first two categories can only be accessed by registered users, and the last two can be also accessed by visitors.

### 3.3. DEVELOPMENT PHASE

In the development phase, the categories were implemented, the virtual classrooms created, the images representing the categories were chosen, supplementary texts were added, and strips<sup>5</sup> created to highlight each topic in the course. Especially, 19 video lessons on pedagogical approach, resources, and VLE setup were recorded and edited, as shown in table 1.

<sup>5</sup> A textual genre that looks like a newspaper clipping.

**Table 1:** List of video lessons created for the course.

Title	Length (min.)
Pedagogical Approach	23
Introduction and Chat	7 and 3
Classroom setup	8
Journal and Forum	4 and 10
Glossary and Groups	3 and 7
Adding pages	5
Link to a file	4
Message and Navigation	4
Notes	15
Questionnaire	12
Reports and Labels	5 and 3
Summary and Topics	5
Task	5
Wiki	7

In the first category, meant to train teachers in using VLEs in classroom-based education, we chose to create a MOOC because it brings together social media connectivity, facilitation by an expert in a field of study, and a collection of online free resources.

Asw MOOC is based on the active participation of students who self-organize according to their learning goals and previous knowledge, as stated by Mcauley et al (2010), it is believed to afford free access to a high number of users and give them autonomy to set their own study pace.

The structure of the MOOC called “Using VLEs in classroom-based education” comprised the following elements: Introduction, Preliminary Instructions, Literature, Building a Virtual Classroom, Pedagogical Approach featuring teaching sequences, and Final Considerations.

Instructions in the form of text and cartoon-like strips were added to each topic using Moodle labels. Also used were the “link to a page” for access to the video lessons, “link to a file” for access to supplementary texts, and “link to a URL (Uniform Resource Locator)” to go to internet pages related to the contents, as shown by the images in Figures 1 and 2.



### MOOC sobre uso de Ambientes Virtual de Aprendizagem na educação presencial

**Figure 1:** MOOC homepage.

## Orientações Iniciais



Figure 2: MOOC strip

As determined in the project design and analysis phase, MOOC not only advises teachers on the technological aspects of creating VLE resources but also offers a pedagogical approach based on the TPACK model by Sampaio and Coutinho (2011), which proposes teacher knowledge at three levels: knowledge of curricular contents, teaching methods, and technology skills. Their intersections result in Technological Pedagogical Knowledge, Technological Knowledge of Contents, and Pedagogical Knowledge of Contents (SAMPAIO and COUTINHO, 2011). Therefore, a set of materials was provided for studying the TPACK model and how to use it. Also added was a video lesson on how to create and use teaching sequences. The lesson explained that these sequences are examples of a pedagogical approach that may be used in blended learning, because face-to-face meetings are initially required to introduce the contents, and later on the activities can be done in the classroom or online. Additionally, a link to a web page containing several examples of teaching sequences was also provided<sup>6</sup>.

To provide examples of the use of teaching sequences in virtual learning environments, a TS was prepared about text types and genres using the topic “lowering the age of criminal responsibility,” and another on “relative positions of straight lines and a plane.” An

instructional design matrix<sup>7</sup> was put together for each teaching sequence. The teaching sequence about text types and genres contained a larger number of activities and required a greater understanding of technological resources from students, such as how to do online searches, text writing, using text editors, recording videos, and others. Teaching sequence 2, about “relative positions of straight lines and a plane” contained a smaller number of activities, considering the students’ age (11 to 12 years). It demanded less technical knowledge and only required basic knowledge of a drawing program and searching the internet.

The second category featured a virtual library containing all MOOC video lessons available for download and a host of resources that can be used to set up virtual classrooms, such as image banks, educational repositories, educational programs, and other things.

The third category provides a space for users to share experiences, namely a forum where they community members can discuss their experience using the Landell Community VLE in their basic education classes. This forum is open to visitors, that is, anyone, even those not registered with the community, can access the room.

Figure 3 shows the experience sharing environment homepage.

<sup>6</sup>sosequencias.blogspot.com.

<sup>7</sup>This action involves planning, developing, and using educational methods, techniques, activities, materials, and products in specific education situations in order to foster the teaching and learning process [6].



Figure 3: Experience sharing room

The fourth and last category organizes a learning space where the virtual classrooms of basic education teachers joining the community are created. These virtual classrooms can only be accessed by students registered by teachers taking part in the community that has created a classroom in the learning space.

### 3.4. IMPLEMENTATION PHASE

After a review of all resources produced

and available in the virtual community, the implementation phase began with the creation of the first classroom for a basic education teacher in the learning space. This first experience was requested by a 9th grade science teacher from a public school in the city of Lavras, Minas Gerais, who had approximately 30 students. To do that, the teacher created a teaching sequence on temperature, heat, and thermodynamic equilibrium using videos, a journal, a forum, and assignments. The virtual classroom is shown in figure 4.

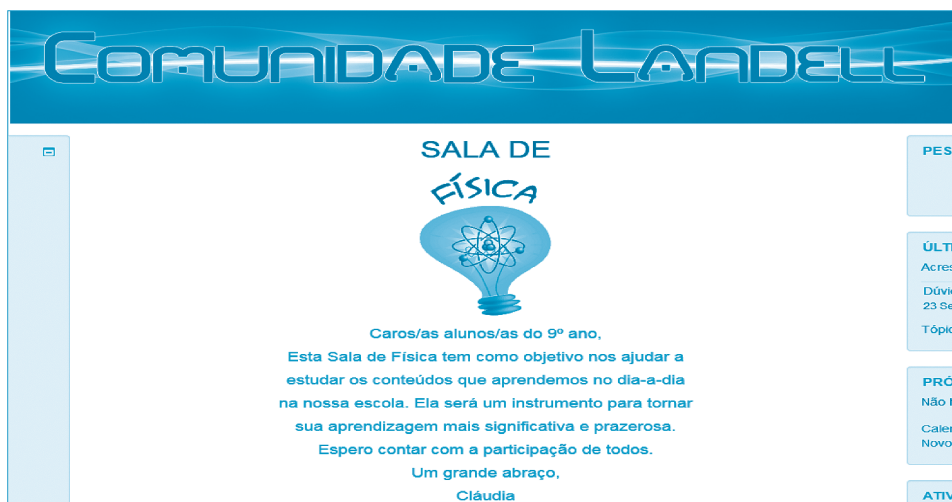


Figure 4: Science Classroom

During the class, training was initially provided on how to use the virtual community and the tools available. The next phase was done online and comprised following the teaching sequence previously prepared. Most students accessed the community from home on their computers. Some used cell phones or tablets. Only 10% of the students failed to access the community and do the activities.

A quantitative evaluation was conducted upon completion of the activities. All those who had accessed the teaching sequence obtained good marks. A qualitative evaluation was conducted as well, based on the students' comments about the teaching and learning process using the Landell Community. We found that all participants considered this approach to be more motivating and meaningful than the conventional class format.

The implementation phase will be complete when at least 50 virtual classrooms of basic education teachers are added. To that end, talks will be organized at some public schools in southern Minas Gerais to spread word about the Landell Community. At a subsequent phase, we plan to expand the community by having information on it feature on websites and in specialized publications.

### 3.5. EVALUATION PHASE

The evaluation phase will be fully carried out as the virtual community is actually used on the MOOC about VLE use. In classroom-based education, there is a specific evaluation resource at the end of the course. The evaluation is to be done by participants, who are asked to report on positive and negative aspects and suggest improvements to the course. In the experience sharing space, there is a comment-enabling resource to which users can post their assessments and opinions about the community.

The comments by the class taking part in the pilot science classroom confirm the

motivating, effective potential of the hybrid model for basic education. There was actual, interested participation by students, and many of them asked for the community to be used permanently. Conducting an in-depth assessment of changes and improvements to the blended learning-using teaching and learning process will require carrying out future research projects using the Landell Community.

## 4. FINAL CONSIDERATIONS

To facilitate the process of developing the virtual learning community, we analyzed the virtual community's requirements as prescribed in the first phase of the ADDIE model. With that, we chose to use a stable Moodle version (2.7), a simple layout featuring few categories, and especially short audiovisual resources addressing specific contents. Texts and links to outside resources were also provided, such as learning objects and educational programs, in an effort to contribute to teacher training and make sure the virtual classrooms were set up using varied, meaningful resources.

The strategy of training teachers to use a VLE in blended learning via a MOOC is yet to be fully evaluated. The MOOC format was chosen in order to foster people's autonomy, as they would be able to begin the course at any time and study independently in the VLE without having to join a given class. Our expectation is that, as more and more teachers get interested in joining the Landell Community and take the MOOC, we will be able to improve it based on participant feedback.

We believe the strategy of offering teaching sequence examples allowed us to advise teachers on how to organize their contents and use virtual classrooms not only to store contents but also to enable, from a creative perspective, the use of technology as a strategy in the teaching and learning process. Such strategy may prove an efficient starting point for other similar initiatives.



As for the TPACK model, we believe it provided a foundation for the teaching sequences because, through it, we realized there was a need to bring together teachers' technological knowledge and VLE tool choices, knowledge of contents in previous studies to be worked on with students, and pedagogical knowledge in the design and sequence of activities. The experience showed it is not the use of technology that matters but instead its association with inputs from the literature in the search for new education approaches and strategies.

Putting together the Landell Community required considerable knowledge of the Moodle resources available and how to create them, many hours invested in researching and selecting the educational resources available on the internet, and preparing teaching sequence examples that combined resources and activities to look deeper into a given content. However, the most complex task was recording and editing the 19 video lessons showing how to create Moodle resources and use them in education. By having created and made it available free of charge, we expect to help teachers save time and individual technical efforts when using these technologies as teaching resources in basic education, thereby contributing to train them in the use of digital technologies in education activities and offering the basic resources necessary for them to maintain virtual teaching and learning spaces with their students.

## REFERENCES

- ABERDOUR, M. **Open Source Learning Management System**. EPIC. United Kingdom, 2007.
- BELTRAN LLERA, J. B. **A Sociedade em Rede**. Artigo, 2007 Available at: <http://www.educared.org/global/educarnaculturadigital/a-sociedade-em-rede>. Retrieved: October 10, 2013.
- CARVALHO NETO, S. **Dimensões de qualidade em ambientes virtuais de aprendizagem**. Tese de Doutorado. Universidade de São Paulo. São Paulo, SP, 2009.
- CASTELLS, M.; CARDOSO, G. **A Sociedade em Rede—Do Conhecimento à Acção Política**. Imprensa Nacional Casa da Moeda. Lisboa, 2006
- DE BETTIO, R. W.; PEREIRA, D. A.; MARTINS, R. X.; HEIMFARTH, T. **The Experience of Using the Scrum Process in the Production of Learning Objects for Blended Learning**. *Informatics in Education*, 2013, Vol. 12, No. 1, 1–14.
- FILATRO, A. **Design instrucional na prática**. São Paulo: Pearson Education do Brasil, 2008.
- GIL, A. C. **Como elaborar projetos de pesquisa**. São Paulo: Atlas, 1991.
- GIRALDO, M. C. G.; ISAZA, G. A. L. *Revista Innovar*, Vol.21(41), 2011
- MACHADO, A. R.; CRISTÓVÃO, V. L. L. **A construção de Modelos Didáticos de Gênero: Aportes e questionamentos para o ensino de gêneros**. *Linguagem em (Dis)curso*, Tubarão, v. 6, n. 3, p. 547-573, set./dez. 2006.
- MARTINS, R. X.; REZENDE, D. de C.; ESMIN, A. A. SILVA, C. R. da. **Ambientes virtuais de aprendizagem na graduação presencial: a avaliação dos estudantes**. VIII Congresso Brasileiro de Ensino Superior a Distância-ESUD, 2011.
- MCAULEY, A. et al. **The MOOC model for digital practice**. Canadá : Universidade de Prince Edward Island Charlottetown, 2010. Available at: [https://oerknowledgecloud.org/sites/oerknowledgecloud.org/files/MOOC\\_Final\\_0.pdf](https://oerknowledgecloud.org/sites/oerknowledgecloud.org/files/MOOC_Final_0.pdf)>. Retrieved: July 16, 2014.

- MORAN, J. M. **Propostas de Mudança nos Cursos Presenciais com a Educação On-Line**. In: XI Congresso Internacional de EAD – ABED. Salvador. 2004. Available at: <[www.eca.usp.br/prof/moran/propostas.htm](http://www.eca.usp.br/prof/moran/propostas.htm)> Retrieved January 13, 2013.
- MORAN, J.M. **A EAD no Brasil: cenário atual e caminhos viáveis de mudança**. 2014. Available at: <http://www2.eca.usp.br/moran/wp-content/uploads/2013/12/cenario.pdf> Retrieved April 25, 2014.
- PRETTO, N. de L. **O desafio de educar na era digital: educações**, Revista Portuguesa de Educação, vol. 24(1), 2011.
- SAMPAIO, P. A. S. R.; COUTINHO, C. P. **Formação contínua de professores: integração das TIC**. Revista da Faculdade em Educação, São Paulo, v. 9, n. 15, p. 139-151, jan./jun. 2011.
- SCHLEMMER, E.; SACCOL, A.; GARRIDO, S. **Avaliação de Ambientes Virtuais de Aprendizagem na perspectiva da complexidade**, 2005. Available at: <http://pt.scribd.com/doc/21015693/Artigo-2005-Avaliacao-de-AVAs-SCHLEMMER-SACCOL-GARRIDO>. Retrieved: June 23, 2014
- SILVA, A. J. de C. **Desenvolvimento de uma comunidade virtual para a inserção da metodologia blended learning na Educação Básica**. 2014. 135 p. Dissertação (Mestrado Profissional em Educação) - Universidade Federal de Lavras, Lavras, 2014.
- TEIXEIRA, M. A. P.; SILVA, B. M. B.; BARDAGI, M. P. **Produção científica em orientação profissional: uma análise da** Revista Brasileira de Orientação Profissional. Rev. bras. orientac. prof, São Paulo, v. 8, n. 2, dez. 2007. Available at <[http://pepsic.bvsalud.org/scielo.php?script=sci\\_arttext&pid=S1679-33902007000200004&lng=pt&nrm=iso](http://pepsic.bvsalud.org/scielo.php?script=sci_arttext&pid=S1679-33902007000200004&lng=pt&nrm=iso)>. Retrieved: March 19, 2013.
- TORI, R. **Educação sem distância: as tecnologias interativas na redução de distâncias em ensino e aprendizagem**. São Paulo: Editora Senac. São Paulo, 2010.