

Virtual Learning Environments (VLE) as Spaces for Formative Research in Postgraduate Studies in Education

María Guadalupe Veytia Bucheli ^a

Received: 3 April 2016 • Accepted: 12 June 2016

Abstract: The following work presents the result of a mixed research study, exploratory and descriptive; carried out at postgraduate studies, with a sample of 20 students enrolled in the first semester of the Master of Education. Its aim was to analyze the use of Moodle as an appropriate Virtual Learning Environment, conducive to strengthen the Virtual Learning Spaces for developing formative research. To carry out this qualitative research, the technological resources of the three first courses that correspond to the first semester of the abovementioned master were analyzed, in addition to the application of a semi-structured interview, from which key variables emerged: the students' concept of research, its linkage to their professional field, and the use and frequency of technological tools in Moodle, as resources to create Virtual Learning Spaces that benefit the processes of formative research in the students. Among the main findings, it was found that students find a close relation between the Virtual Learning Environments and the development of research, which encourages interest for learning and collaborating with peers; however, the role of teachers in enhancing these spaces to strengthen the process of research in their students was also emphasized.

Key-words: Virtual Learning Environments, Virtual Learning Spaces, Formative Research, Postgraduate Studies, Higher Education.

1. Introduction

Higher Education attempts four basic functions: teaching, management, extension studies and research; the latter takes fundamental relevance in the

^a Universidad Autónoma del Estado de Hidalgo (UAEH). Correspondence: María Guadalupe Veytia Bucheli, Universidad Autónoma del Estado de Hidalgo, Carr. Pachuca - Actopan Km. 4.5, 42039 Pachuca de Soto, México. dra.veytiabucheli@gmail.com

XXI century society, since from the perspective of Arechavala (2011), the University is no more a repository of knowledge to place itself with a focus on creation, both individually and collaboratively. From this representation, research training of university students begins to prove itself as one of the priority tasks that enables them with the necessary tools to transit from an information society to a knowledge society.

However, training for research is a challenge for universities; in this regard Hernández, Fernandez and Baptista (2015) argue that it is necessary to strengthening both, the institutional conditions and the trained staff, as well as implementing a where the student trains by doing research from a direct learning, that enhances their investigative skills, and in this way, acquire more tools to meet the needs and demands of their working context, De Ibarrola (1989) confirms this proposal ensuring that

The greatest and most profound training of researchers in a specific degree, is developed through daily performance in the profession, and from the limits and possibilities of personal development, as well as from the field of research itself, where it is achieved.

In recent years, international proposals on this topic have increased significantly, and are exposed by different institutions highlighting the importance that research acquires as a resource for understanding educational issues, and based on the results generated, build strategies that lead to increase the improvement of educational quality, and thus, the performance of students, in the case of UNESCO (2015) states that:

“Scientific research has changed its priorities and moved towards problem solving, and so, respond to the urgent challenges of the development. The change in the research priorities can be clearly seen in the amount of research funds granted to the applied sciences” (p.42)

Tünnermann (2008) argues that research should be integrated in university tasks, however, the problem arises when trying to define the emphasis or focus of research, when questioning where to emphasize and what type of activities are to be developed in the research with students, since most of the courses in the universities are orientated towards teaching research, and not in the training of it, from the perspective of Sanchez (2014).

From this perspective, universities are challenged to train professionals who go beyond theory; where the notion of scientific field is understood, and that according to Bourdieu (2003), represents the social world that exerts control, independently from the pressures of the macro social where it is included. Working from a scientific field, would allow students to strengthen the development of investigative skills, through training that abandons the dividing theory-practice traditional and scholastic paradigms, to work from paradigms that link theory and practice, giving sense and meaning to their daily work in the professional field; but at the same time, enhancing its analysis through a view oriented to the research; learning to research by researching; working with people who have more experience in research, as

well as with peer groups, where learning communities are generated from a horizontal perspective, where members have something to learn and something to share with others.

Another aspect that has made the methodological research process more complex is the use of Information and Communication Technology, where work is developed from new spaces that allow acquisition of information, as well as interaction with people, both synchronously and asynchronously; in this sense, the field of research would not only be addressed from natural and urban environments, but also from digital environments (Chan, 2004).

Based on the above proposals, the goal of this research was to analyze the use of Moodle as a Virtual Learning Environment conducive to strengthening Virtual Learning Spaces for developing formative research.

2. Theoretical framework

2.1 Virtual Learning Environments and Spaces (VLE) and (VLS)

The concepts of environment and learning environment have been present in the field of education for a long time, and when carrying out the literature review of these terms, they are sometimes used interchangeably; however, it is important to set up the conceptual difference between them for the approach this research.

From the perspective of Duarte (2013), the environment refers to the interaction that is set up between the human being with the natural environment that surrounds them, awarding it an active conception, since it involves the human being and the pedagogical actions in which they learn, leading to think on their own actions. In this sense, the difference is clear, the environment is not only the physical environment, but the elements and subjects that surround it; it refers to the mediation and interactions performed, and that create a learning space. In this sense, the environment would have a static nature, while the space a dynamic one.

According to the perspective of Churches (1996), the learning environment consists of four dimensions: a) the physical dimension, which identifies the space and how it is organized, in a way that different scenarios can be created to perform several activities with students; b) the functional dimension, which defines the purpose and use of the spaces and the conditions in which the activities are performed; c) the temporal dimension, which highlights how and when the spaces are used and the different times in which activities are performed with students; and finally d) the relational dimension, which identifies who uses the space and the conditions in which it is.

The following figure is a graphic representation of the learning environments and learning spaces and their dimensions:

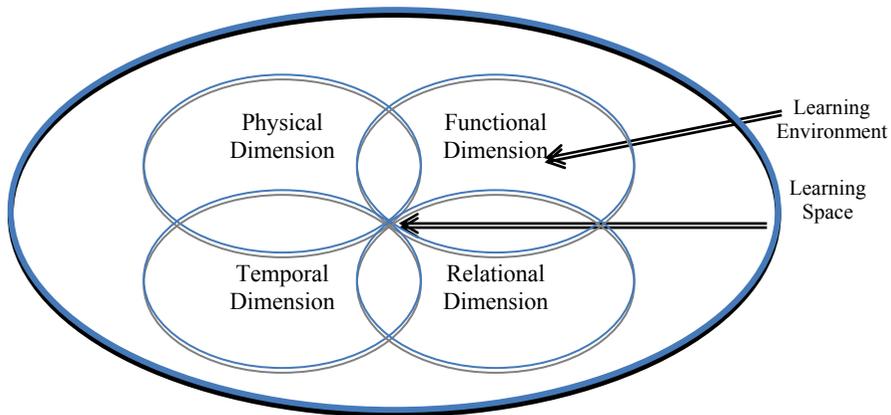


Figure 1. *Learning Environments and Learning Spaces*. Source: Iglesias (1996), Chan (2004)

The learning environment is the intersection of the physical, functional, relational and temporal dimensions; it is integrated by the subjects, as well as the processes that develop from their interaction; it is surrounded by the learning environment, the first is characterized by being dynamic and complex, and it is influenced by the features and elements of the second.

Approaching this topic from a virtual perspective, the notion of learning space considers environments that are no longer limited to the natural and urban contexts, but to the digital environment; in these three environments, acts and interactions are carried by the subjects, which settles the development of the learning space (Chan, 2004). Virtual Learning Environments (VLE) have supported the interactions in the educational process, and is it directly related to three elements: content, student's performance and teacher's performance (Coll, Mauri and Onturria in Bustos and Coll, 2010).

Moodle is a Virtual Learning Environment (VLE); it is a Learning Management Systems (LMS) application, an acronym that stands for Modular Object Oriented Dynamic Learning Environment (Baths, 2007), and it is when teachers and students work in Moodle that the Virtual Learning Space (VLS) is generated.

2.2 Formative research and research training in postgraduate studies

The relevance of developing research, both in undergraduate and graduate studies has increased significantly in recent years; it is relevant that students are able to identify and understand the problems they face, and solve those from a scientific perspective. Specifically, postgraduate studies can be classified into two types, research-oriented and professionalizing; in the second type of studies, work is done from a pedagogical research, which is known as formative research, and it is defined by Miyahira (2009) as:

“A tool in the teaching-learning process, that is, its purpose is to spread existing information and encourage the student to merge it as knowledge (learning). Formative research can also be referred as teaching through research, or teaching using the research method”. (p.1)

According to Restrepo (2003), there are three meanings related to the term formative research; the first is synonymous of an exploratory research, as a search for needs and problems that occur in a specific context; the second refers to training in and for research from different types of activities, using the methodology of Problem-Based Learning; and finally, the third points out that research allows the transformation of practice, that is, it recuperates the importance of identifying the problematic situation, assess it, and carry out activities and strategies to transform it.

This type of research is characterized from Gamboa's proposition (2013) as a pedagogic strategy based on the constructivist perspective, he stresses the active participation of both the student and the teacher in the development of the research process in specific situations that occur in the classroom, which allow the confrontation between empirical facts with theoretical views, i.e., it becomes a thoughtful circle that moves from theory to understand it by analyzing practice, and from practice to describe it from the theoretical perspective, the events occur in the classroom, and from this context, the reason and the way to solve them occur.

Sarabiego, Ruiz and Sanchez (2013) mention three principles on which formative research focuses: 1) the question, the doubt, where the student takes an active role of self-learning and administrator, 2) the non-directivity of the teacher, as he serves a guide, counselor, a mediator; and finally 3) the inductive teaching, which takes the student as the center of teaching-learning process, which involves the interaction that takes place between the environment, the educational community and the curriculum, and in this way, proposals and collaboratively conclusions between different actors and from different perspectives, both theoretical and empirical are constructed.

According to Rama (2007, p. 33) "postgraduate studies represent the modern way where the wide and growing variety of disciplines expresses, and the process, which associated with the evolution of social division and technical work, are created; recreating, disappearing or merging the different existing disciplines ", from this view, it can be perceived as a dynamic process that clearly shows the relationship between the academia and the workplace, since it is does not remain static, but it evolves according to the needs that appear in different work contexts.

2.3. Formative research Environments and Virtual Learning Environments

The development of formative research is present in both, classroom and virtual settings; and in this second space, its use has increased considerably over the last decade, not only for the distance programs, but also

for traditional and mixed modalities, supported by educational platforms like Moodle, Blackboard and Sakai, to name a few.

However, the challenge is not on the search of information but on moving from information processes to knowledge processes, as Castells (2001):

“States that the way to understand education in today's society is oriented towards the acquisition of the necessary intellectual capacity of learning to learn throughout life, getting information digitally stored, recombining it and using it to produce knowledge for the desired goal every time”. (p.307)

Research processes from the use of Information and Communication Technology have changed considerably; some years ago, the main difficulties were presented by the lack of material on a subject, now, information on different topics is huge, and one can get access to it easily, however, this process has become more complex in assessing what type of information is reliable, updated and relevant. The XXI century researcher can get access to different services using ICT, Guazmayan (2004) explains the following: remote connection to other equipment, transference of information, use of email, participation in discussion forums and use of different tools such as wikis and blogs, to name a few.

In addressing the topic of formative research in learning environments and spaces, similar traits and characteristics as those considered in classroom environments are identified; however, the conditions where they develop are different, and are characterized according to Londoño (2011), a Problem Based learning (PBL) model to think on their own learning process; a devoted teacher who plays the role of mediator, guide, facilitator, and has digital skills to move in Virtual Learning Environments and Spaces; collaborative work and participation in networks where communication between the participants is performed both synchronously and asynchronously, using specialized databases to deepen on the subject under study from the analysis of current instruments and quality.

3. Methodology

This research was developed from a mixed methodology, which focuses on understanding the object of study from quantitative data, as well as from the perspective and point of view of the participants in relation to their context (Hernández, Fernandez and Baptista, 2010), with an exploratory / descriptive scope, since its purpose was to analyze the use of Moodle as a Virtual Learning Environment conducive to strengthen the Learning Spaces for developing formative research.

The research was conducted in the context of a public institution in the state of San Luis Potosi in Mexico, which offer Bachelor, Master and Doctorate programs in Education, research was done with the first semester of

the Master of Education, whose population is 20 students, 18 women corresponding to 90%, and 2 men, equal to 10%. The average age of students is 23 years. On the graduation rate of the bachelor program, 95% corresponds to the degree in Elementary Education and 5% corresponds to the Bachelor in Basic Education, 95% of the population is working as classroom teachers in the elementary level and 5% of the population is dedicated exclusively to master studies, which is complex because of the professionalizing orientation of the program, in which the academic units that are developed demand a link between theory and practice from teachers in their classrooms, and from that, a thinking process for raising awareness of the context, and the transformation of the practice is generated.

The professionalization orientation of the Master in which the study is conducted, "are intended to provide students with a broad and solid training in a field of knowledge, with high capacity for professional practice" (CONACYT, 2015, p.11); and it is developed from formative research, which presents two main purposes: pedagogical and training, which is intended for the student to learn research by researching and thinking on their own practice; and based on this, they acquire more tools for identifying and solving the problems that occur in the classroom with their students. Such type of research has two main characteristics "it is directed and guided by a professor as part of their teaching and research activity and the research agents are not researchers, but research subjects in training" (Arakaki, 2009, p.1).

As this is a with mixed methodology study, it was divided into two stages, in the first an analysis of the courses that students took in the first semester was conducted, and the recovery of the amount and frequency of use of technological tools was recovered from a quantitative view.

For the qualitative analysis the technique used was the interview, which is defined by Alonso (2007) as:

"A conversation between two people, an interviewer and an informant, directed and recorded by the interviewer with the purpose of promoting the production of a conversational, continuous and with an argumentative line, not fragmented, segmented, pre-coded and closed by a previous questionnaire from the respondent about a defined topic in the framework of the research" (p.228).

The interview guide was structured with 10 questions that delved into the development of Virtual Learning Spaces in the Moodle platform as spaces to strengthen research, which was raised from four main variables, the first in which students defined research from their previous referents; in the second they thought about the relationship set up between research and their work as teachers of basic elementary education; the third to assess the link between research and master they are studying; and finally, the last variable was focused on the development of research in Virtual Learning Spaces, from the use of Moodle.

As for the analysis and interpretation of information, this was carried out in the following times: in the first time the analysis was quantitative and it identifies the use of the platform in the three courses that correspond to the first semester; the second time was for the design, piloting and implementation of the interview for randomly selected students, and a third time, the transcription of information as well as its categorization; finally, the analysis, interpretation and conclusions.

4. Results

As mentioned in the previous section, the study was divided into two stages, the first quantitative and the second qualitative oriented; from the analysis and interpretation of the information obtained, some findings in relation the use of Environments and Learning Environments as spaces to enrich the formative research were identified.

Quantitative results are represented in the following graph:

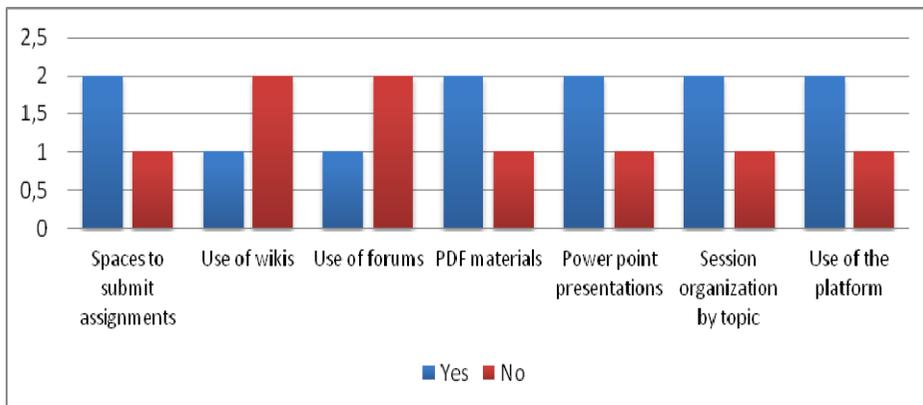


Table 1. *Use of Moodle. Source: Veytia Bucheli (2016)*

When analyzing the results, these show that one out of the three teachers in charge of the academic units corresponding to the first semester of the master does not use it, even though it is demanded by the institution, and two of them use it indeed to strengthen the teaching - learning process that is developed in the classroom session; additionally, they also perceive it as a preparation space for the next session, referred by the institution as inter-session. 66 % structure the sections by topic; there is also evidence that both students and teachers submit PDF files and Power Point presentations to work in their classroom sessions.

On the tools to improve communication between students and collaboratively knowledge construction, only 33% have used Wikis to deepen into a topic, and manage forums to discuss on the topics, linking theory and

practice by sharing experiences and situations in their contexts, which set up alternatives of solution, argued from a theoretical viewpoint, from the identification of the empirical problem of its context.

No evidence was found in the analysis on the courses of the academic units in the first semester about the management of other activities or resources that presents the Moodle platform such as: databases, chat, asking, questionnaires, predefined surveys, external tool, Hotpot, JClíc, Lesson, SCORM, Workshop; and in terms of the resources, there is no evidence of the use of labels, books, pages, content package. Based on the results obtained, a very low percentage is related to the activities and resources offered by the Virtual Learning Environment, in this case, the Moodle platform, as a base for generating Virtual Learning Spaces with the students. Findings from the qualitative part were structured in the following categories of analysis:

Research Conceptualization and research skill. In this category, one of the key words that students use to define research was inquiry, and their argument was oriented in three directions, the first related to developing a topic of interest which is relevant for their professional development as for the different areas in their lives. The second is related to the need to know different theories that support and solve the problems that occur in context with their students, sustaining this with theoretical basis. One of the respondent states that "research covers several aspects, focused to the students, it is the way to inquiry or search for information necessary to solve any problem that occurs in the group," and finally, the third direction, to enrich their knowledge, to complement what they already know and to test the hypotheses they have on a certain topic.

In addressing the issue of research skill, they defined it as the development of skills that enable people to know what, how and where to find information to understand a topic and / or the resolution of problems that come up, as well as the use of different tools to do so. In this section they mentioned the importance that the context represents in achieving the skill. None of the students mentioned knowledge and values as elements of the skill, they only focused on the aspect related with the know-how, that is, the abilities and skills.

Research in the workplace. On the relationship that emerges between research and the respondents' workplace, in this case in the context of Elementary Education, 1st, 2nd, 3rd and 4th grade, those interviewed expressed that immersing into research is very useful for understanding their context, for careful thinking about the way they carry out their teaching practice, for identifying the problems that arise with greater certainty, and for generating actions that improve it.

They also stated that having children with different characteristics and learning styles in their groups, along with the formative research they are

learning in the master, has enabled them to apply diagnoses more accurately. For example, 15% said they know and use Honey and Alonso's questionnaire to assess learning styles; and based on the results, they perform different activities and strategies that enable their students to build knowledge, both individually and collaboratively.

Another aspect that they highlighted is the importance that research represents in their teaching practice is related to the values and attitudes. As they mention, some of the behaviors identified in the children should be understood from theory, and based on it, find solutions to improve students' behavior. One of the respondents said that "in the classroom, conflicts and situations arise and need to be documented, to find a solution to such conflict, and improve our practice", this means, from the first semester, in their opinion, the professional focus of the master becomes meaningful because they set up a link between the theoretical referents they are studying and the situations and events that they face every day with their students, and make the best decisions to solve them.

Link between postgraduate studies and research development. The next category of analysis was defined on the relationship identified between their graduate studies and the development of the research process. 100% of the respondents affirm that there is an explicit link between postgraduate studies and the development of the research in their teaching practice. In general, they emphasize that search of information in references, both bibliographic and electronic has increased. They, also mention that they have thought more deeply about their teaching practice, how they do it and what for. Thus, they analyze their work with their students with a different perspective, which makes them more committed to their profession.

Another respondent also confirms the relationship between postgraduate studies and the development of research, identifying this process has been very useful to her. In this sense, she argues the following: "I had some idea of what a master is, but it exceeded my expectations because somehow I have learned a lot, as with the coming reforms, I have better understanding of the information, better understanding of the reality by digging into theory and by contextualizing it into my teaching practice. It got me involved with new ways to work, which are focused more on learning than on teaching".

Finally, another contribution from the subjects is recovered, in which she states that it has been important to study the master as she mentions that "a while ago, I graduated from the bachelor of Elementary Education, but eventually it is forgotten. If one researches, one makes use of it, but not very often; with the master I have realized how important is to research, to share experiences, to improve practice and to develop a better job compared to previous years. Research becomes a habit, and those who benefit the most are my students". Her participation confirms the importance of continuous training, to be updated and to generate new learning spaces for her students.

Development of research in Virtual Learning Spaces. In this section, it is important to define Virtual Learning Spaces (VLS), which, it has been conceptualized as "the set of environments of synchronous and asynchronous interaction, where, based on a curriculum, the teaching-learning process carried out, through a learning management system" (Lopez Rayon, Stairs and Ledesma, 2002, p.3). For this reason, the dynamic nature of the environment is reiterated, and in turn, their complexity, as the subjects are the ones that generate learning, both individually and collaboratively when creating knowledge networks from their contributions.

Use of Moodle Platform. One of the Virtual Environments in which Virtual Learning Spaces are developed in the institution under study is the Moodle platform, which is "an environment that allows the development of training activities through the network, integrating different basic tools in the same interface, in a way that that different users can perform all the activities of the training process from the same environment" (Hernandez and Medina, 2015, p. 3).

In the interviews, the students expressed that they have had successful experiences in the use of Moodle; they refer some courses to be updated. For example, a student says "once I was working on a platform; by taking an online course, I had the opportunity to communicate with colleagues from other states, such as Oaxaca and Chiapas. The topic was given, there was a lot of participation in discussion forums, where we shared children's similarities and differences and where and the problems presented in different contexts allowed me to share my experiences and improve my work and encourage learning in my students". Another student also tells her experience in the use of Moodle to take a course and she mentions, "we connected when possible, each one according to their times, we participated in forums and we submitted tasks; although we were not in the same space, we were by a common goal". She specifies the advantages of working asynchronously, adapting to time available, and the flexibility offered by an educational model that makes use of technological tools.

100% of the students emphasize that working in the Moodle platform is one of the strengths of the master's program, as it is useful to enrich and broad knowledge covered in the sessions; in this sense, a student assures the following: "we have classes that allow us to relate to forums, emails, specific websites and complement information in a collaborative way".

Regarding the use of Moodle, the students point out that one of the tools that favors the development of research is working with forums, for the presentation of different points of view on a particular topic, as well as the confrontation and argumentation of positions, which favors the construction of knowledge and development of research. A student argues that working in forums "allowed the creation of study circles to share materials like

experiences and problems, giving different alternatives of solution”; based on this experience, an example of the construction of Virtual Learning Communities, where each one of the members has knowledge to share, and in turn, also receives comments from their peers.

Overall, the respondents agree on the importance of forums on the platform to participate actively in spaces oriented to the presentation, argumentation and discussion of problems that arise in their context with their students, proposing some alternative solutions and implementing strategies to improve the teaching - learning process, so they recognize it as a space for both professional and personal growth that benefits the development of research.

In relation to the link of research with Virtual Learning Spaces, a student affirms that "research creates a habit, it becomes a skill, things become easier and doubts clear, I think that in Virtual Learning Spaces you can create a connection with others who are researching the same, and collaborative networks are created". This process has been experienced with her classmates, but also with some of her coworkers.

One of the technological applications that have been useful to set up communication between the master's students from the view of Information and Communication Technology is the use of WhatsApp, the most informal practice used by respondents. They say that they have formed a group of postgraduate students to externalize questions about the activities and tasks requested by their teachers, as well as to share data and information on articles or topics useful to work in their contexts.

Another tool used by students, to strengthen the development of research in virtual learning spaces and the use of technology is the Digital Library, where they consult the databases of Eric and Scielo, to find articles on topics of their interest and problems identified in their context; in this regard, one respondent states that "there is the virtual library, it has been very positive, since sometimes is not possible to attend a public library, and now it is very easy to find the book on a subject I am interested in the virtual library, I can search by author, and I also find a short summary about the book"

Interviews with master students confirm the importance of the use of Virtual Learning Spaces to strengthen research; in this sense, one of the participants assures that "research is not only done in a book or in a library, with Information and Communication Technology one can search for information on the internet, find information to solve a problem that arises in my context with my students"; however, the use of technological resources still empirical: based on the results, it is important to strengthen their use, and provide the necessary tools to optimize their use.

5. Discussion and conclusions

Interestingly, the results obtained from both quantitative and qualitative analysis, on the use of virtual learning spaces to encourage the development of research in students in the first semester of the Master of Education, allowed assessing both the strengths and areas of opportunity in terms of technological tools as well as the subjects involved in this process.

Both quantitative and qualitative results are contrasting, as they clearly show the differences between teachers and students on the interest and appropriation of Information and Communication Technology. On one hand, the use of Information and Communication Technology by teachers is null, and on other hand, it is limited. Based on the findings from qualitative data, the importance given to Technologies by the students as a tool to strengthen their postgraduate studies, and so, the development of the research process by means of the use of the resources provided by the institution, and informal technological tools such as WhatsApp.

One of the first relevant findings from the qualitative results is that one of the teachers does not use the Moodle platform as a space to promote Virtual Learning Spaces oriented towards research, although it is an institutional demand. Two of the teachers upload materials both in PDF and Power Point for students to prepare themselves for the classroom session, and to enrich the issues discussed in class; however, only one teacher uses tools that strengthen collaborative work with students, like the use of forums to discuss issues and deeply analyze some of the topics covered in class, as well as the development of Wikis on any subject.

Regarding the qualitative findings, it is relevant to note the interest shown by students with the use of Information and Communications Technology in general, as well as use of Moodle, which strengthens the development of investigative skills when searching for information in electronic media, to communicate with peers both synchronously and asynchronously, to share information and point of view by using tools such as the forum, to work collaboratively through Wikis, also to use other technologies such as WhatsApp to set up a network of communication and collaboration as a group.

Clearly, Learning Spaces are no longer limited to classroom spaces. It is increasingly common to find Virtual Learning Spaces, where communication between teachers and students, both synchronously and asynchronously is favored; however, it is a reality that most teachers belong to the group of digital immigrants and most students in the group of digital natives, therefore it represents a challenge for teachers to break schemes and to work from new spaces to respond to current educational demands.

It should be noted that the results show a first approach to context of study, however, the findings confirm the importance of using virtual spaces today. Additionally, it opens doors to further analysis on this issue, analyzing

groups in more advanced semesters, as well as other contexts in similar conditions, and generate a comparison to further design strategies of improvement to increase the use of Virtual Learning Spaces.

References

- Alonso, L. E. (2007). Sujetos y Discurso: el Lugar de la Entrevista Abierta en las Prácticas de la Sociología Cualitativa. En: J. M. Delgado y J. M. Gutiérrez, (Coord). *Métodos y Técnicas Cualitativas de Investigación en Ciencias Sociales* (pp. 225-240). España: Síntesis.
- Arakaki, (2009). La Investigación Formativa y la Formación para la Investigación en el Pregrado. *Revista Médica Herediana*, 20 (3). <http://dx.doi.org/10.20453/rmh.v20i3.1010>. Retrieved from: <http://www.scielo.org.pe/pdf/rmh/v20n3/v20n3e1.pdf>
- Arechavala, R. (2011). Las Universidades y el Desarrollo de la Investigación Científica y Tecnológica en México: Una Agenda de Investigación. *Revista de la Educación Superior*, 40 (158). Retrieved from: http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S0185-27602011000200003
- Baños, J. (2007). *La Plataforma Educativa Moodle. Creación de Aulas Virtuales*. Retrieved from: http://www.fvet.uba.ar/postgrado/Moodle18_Manual_Prof_1.pdf
- Bordieu, P. (2003). *El Oficio de Científico. Ciencia de la Ciencia y Reflexividad. Curso del College de France 2000 – 2001*. Barcelona: Anagrama.
- Bustos, A. y Coll, S. (2010). Los Entornos Virtuales como Espacios de Enseñanza y Aprendizaje. Una Perspectiva Psicoeducativa para su Caracterización y Análisis. *Revista Mexicana de Investigación Educativa*, 15 (44). Retrieved from: http://www.scielo.org.mx/scielo.php?script=sci_arttext&pid=S1405-66662010000100009
- Castells, M. (2001). *La Galaxia de Internet. Reflexiones sobre Internet, Empresa y Sociedad*. Barcelona: Plaza & Janés.
- Chan, M. (2004). Tendencias en el Diseño Educativo para Entornos de Aprendizaje Digitales. *Revista Digital Universitaria*, 5 (10). Retrieved from: http://www.revista.unam.mx/vol.5/num10/art68/nov_art68.pdf
- CONACYT (2015). *Marco de Referencia para la Evaluación y Seguimiento de Programas*.
- De Ibarrola, M. (1989). La Formación de Investigadores en México. *Universidad Futura*, 1 (3), 12-27.
- Duarte, D. (2013). Ambientes de Aprendizaje: Una Aproximación Conceptual. *Estudios Pedagógicos Valdivia. Revista Iberoamericana de Educación*, 29, 97-113. [48](http://dx.doi.org/10.4067/s0718-</p></div><div data-bbox=)

07052003000100007. Retrieved from: <http://www.rieoei.org/deloslectores/524Duarte.PDF>
- Gamboa, C. (2013). *Apuntes sobre Investigación Formativa*. Ibagué: Colombia. Retrieved from: http://idead.ut.edu.co/Aplicativos/PortafoliosV2/Autoformacion/materiales/documentos/u2/Apuntes_sobre_investigacion_formativa.pdf
- Guazmayán, C. (2004). *Internet y la Investigación Científica. El Uso de los Medios y las Nuevas Tecnologías en Educación*. Colombia: Editorial Magisterio.
- Hernández, E. y Medina, F. (2015). Estrategias de Aprendizaje Basadas en Entornos Virtuales de Educación Secundaria. *Revista Científica Electrónica de Educación y Comunicación en la Sociedad del Conocimiento*, 15 (2). Retrieved from: <file:///C:/Users/POSGRADO/AppData/Local/Temp/72-149-1-PB.pdf>
- Hernández, R., Fernández, C. y Baptista, P. (2010). *Metodología de la Investigación*. Perú: McGrawHill.
- Iglesias, M. (1996). *Observación y Evaluación del Ambiente de Aprendizaje en Educación Infantil: Dimensiones y Variables a Considerar*. Retrieved from: http://cvonline.uaeh.edu.mx/Cursos/Maestria/MTE/Gen03/disenio_prog_ambientes_aprend/unidad_2/Observ_y_eval_del_amb_de_aprend_eneduc_infantil_RIE_Iglesias.pdf
- Londoño, J. E. (2011). La Investigación Formativa en Entornos Virtuales. *Revista Virtual Católica del Norte*, 34, 1-7.
- López Rayón, A.E., Escalera, S y Ledesma, R. (2002). *Ambientes Virtuales de Aprendizaje*. Instituto Politécnico Nacional. Presimposio Virtual SOMECE. Retrieved from: <http://www.somece.org.mx/virtual2002>
- Miyahira, J. (2009). La Investigación Formativa y la Formación para la Investigación en el Pregrado. *Revista Médica Herediana*, 20 (3). Retrieved from: <http://www.scielo.org.pe/pdf/rmh/v20n3/v20n3e1.pdf>
- Rama, C. (2007). *Los Postgrados en América Latina y el Caribe en la Sociedad del Conocimiento*. México: Idea Latinoamericana Colección.
- Restrepo, B. (2003). Investigación Formativa e Investigación Productiva de Conocimiento en la Universidad. *Revista Nómadas*, 18, 195-202. Retrieved from: http://www.ucentral.edu.co/images/editorial/nomadas/docs/nomadas_18_18_inv_formativa.PDF
- Sánchez, R. (2014). *Enseñar a Investigar. Una Didáctica Nueva de la Investigación en Ciencias Sociales y Humanas*. México: ISSUE.
- Sarabiego, M.; Ruiz, A. y Sánchez, A. (2013). El Valor de la Investigación Formativa para la Innovación y el Desarrollo Competencial en la Educación Superior. En T. Ramiro Sánchez y Ma. T. Ramiro. *X Foro Internacional sobre la Evaluación de la Calidad de la Investigación y de la Educación Superior (FECIES)*. Granada: Asociación Española de Psicología Conductual (AEPC).

- Tunnerman, (2008). *La Educación Superior en América Latina y el Caribe: Diez Años Después de la Conferencia Mundial de 1998*. Colombia: Javieriana, UNESCO & IESALC.
- UNESCO (2015). *Informe de la UNESCO sobre la Ciencia. Hacia 2030*. Resumen Ejecutivo. Francia: Ediciones UNESCO. Retrieved from: <http://unesdoc.unesco.org/images/0023/002354/235407s.pdf>



© 2016 Veytia Bucheli; licensee International Journal of Educational Excellence, Universidad Metropolitana (SUAGM). This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly credited.