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Virtual environment and teaching methodology in Higher Education in on-site modality

*Ambiente virtual e metodologia de ensino na Educação
Superior na modalidade presencial*

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Abstract

This paper discusses the use of virtual environments in Higher Education in the presential modality. It comes from reflection on the results of qualitative research on exploratory-interpretative processes of interaction and mobilization of knowledge identified in students from a classroom course in Mathematics using resources from virtual learning environments. The theoretical framework is based on Thompson (2004), Primo (2008), Silva (2010), Scherer (2005), Charlot (2000), among others, with regard to the processes of interaction and mobilization of knowledge; in Guérios (2002) and Doll Jr. (1997) regarding the methodology of teaching in teacher

education. The methodology of teaching is considered in an epistemological perspective that considers the relationship between subject and knowledge in the light of the curriculum learning. We observed that knowledge was mobilized in the interactive process and that there was conceptual learning of theoretical foundations of the Methodology of Teaching Mathematics subject. We discuss these results in view of the methodology of teaching in initial teacher training. We conclude pointing to the possibility of building a teaching methodology for higher education in the classroom mode, in which the spaces and virtual classroom environments are used as articulated environments, in the context of pedagogical practices that favor the existence of a reflexive learning movement.

Keywords: Virtual learning environments. Mathematics education. Teacher education.

Resumo

Este artigo trata da utilização de ambientes virtuais na educação superior na modalidade presencial. Advém de reflexão sobre resultados de pesquisa qualitativa de natureza exploratório-interpretativa sobre processos de interação e de mobilização de conhecimentos identificados em alunos de um curso presencial de Licenciatura em Matemática usando os recursos chat e diário de ambientes virtuais de aprendizagem. O referencial teórico tem como bases Thompson (2004), Primo (2008), Silva (2010), Scherer (2005), Charlot (2000), dentre outros, no que diz respeito aos processos de interação, mobilização de conhecimentos e mobilização para o aprender; em Guérios (2002) e Doll Jr. (1997) quanto à metodologia do ensino na formação de professores. A metodologia do ensino é considerada numa perspectiva epistemológica que contempla a relação entre sujeito e conhecimento com vistas à aprendizagem dos conteúdos curriculares. Observamos que conhecimentos foram mobilizados no processo interativo e que houve aprendizagem conceitual de fundamentos teóricos da disciplina Metodologia do Ensino de Matemática. Discutimos os resultados na perspectiva da metodologia do ensino na formação inicial de professores. Concluímos acenando para a possibilidade de construção de uma metodologia do ensino para a educação superior na modalidade presencial em que os espaços virtual e presencial sejam utilizados como ambientes articulados no contexto da prática pedagógica que propiciem a existência de um movimento reflexivo de aprendizagem.

Palavras-chave: *Ambientes virtuais de aprendizagem. Educação matemática. Formação de professores.*

Introduction

This article deals with the use of virtual learning environments in the physical learning environment in higher education. We were motivated by the results of a research on the processes of interaction and mobilization of knowledge identified and interpreted, in students of a traditional in-class course in Mathematics Teaching of a public institution of higher education with the use of virtual learning environment resources in classes of Teaching Methodology in Mathematics. The focus of this article¹ is the mobilization of pedagogical knowledge in a learning perspective made possible by the interactive process, with the use of synchronous and asynchronous communication resources. We envision that such mobilization in the virtual environment may be a structural element of teaching methodology for higher education in the classroom learning modality.

We understand the Virtual Learning Environment (VLE) as something that allows the creation of a space for research and the occurrence of learning processes by both interpersonal and between people interactions, objects of knowledge and learning resources of all kinds, which can be posted on a virtual space.

The synchronous communication system² used in this study was the chat. This virtual space was given for discussion and reflection among

¹ For Guérios and Sausen (2012), the focus was on the mobilization of curriculum knowledge in a pedagogical practice perspective.

² *The synchronous communication* occurs in real time, with sender and receiver both present at the same place at the same time, i.e., the interaction depends on the presence of all the educational process members.

students, teachers and researchers bearing in mind that the chat allows simultaneous interaction among participants because it allows multi-user communication. According to Silva (2005, p. 4), the chat “[...] strengthens on-line interactions when it promotes the sense of belonging, emotional bonds and interactivity. Mediated or not, it allows thematic discussions and collaborative elaborations that strengthen ties and boost learning”.

The asynchronous communication system³ used in this study was the Online Journal. This virtual space was designed for students to post their notes on the topics that were discussed (both in class and virtually) during the research. We did it in the perspective indicated by Scherer (2005), who sees it as a space for students to record their reflections, their awareness and their learning, where the teacher can plan new actions throughout the process of teaching and learning, from the reading of records that are posted and that can be consulted at any time, as well as chat records.

The motivation for developing this research came from our experience as teachers in higher education in traditional and distance learning modalities and from results of investigation into teacher training involving resources from the distance education, as shown in the two examples below, which met our research focus.

Santos et al. (2010) researched initial teacher education with the help of methodologies and tools from online interfaces and identified an increase in possibilities for interactivity between students and teachers through the joint participation, the interference in the production of the pairs and the possibility of multiple articulatory networks that have settled among them. They also observed that the virtual environment enables the maintenance of posts for ongoing consultation to participants, thus there are pedagogical benefits. In our opinion, these advantages are of interest to the study of links between theory and practice that feed the

³ *The asynchronous communication occurs at any time and the members do not need to be present at the same place at the same time, i.e., interaction occurs irrespective of the simultaneous presence of the sender and the receiver of a message in the educational process.*

constant organization of teaching methodologies, and to the evaluation on students' learning outcomes regardless of the teaching modality.

Viseu and Ponte (2012), while researching the training of Mathematics teachers focused on the role of Information and Communication Technologies (ICT) in the development of aspects of didactic knowledge and reflective ability of future mathematics teachers during the period of the internship. The educational knowledge is the kind of tasks and forms of communication, curriculum content of the subject. They concluded that ICT enabled the sharing and discussion of classroom situations in a joint work between tutors and trainees, which contributed to the development of educational knowledge and reflective capacity of the trainees. We developed different types of tasks that promoted forms of communication beyond the unidirectional. The interpretation, questioning and reconstruction of some moments experienced by students have contributed so that they could have in their own practice a source for learning to teach.

Our reflection is structured in establishing connections among resources of virtual learning environments, teaching methodology and teacher education in the traditional classroom education, for which we present below our understanding of Teaching Methodology.

Understanding of Teaching Methodology

Our understanding is supported by Guérios' approach (2002) which deals with Teaching Methodology in an epistemological perspective that considers the relationship between the individual and knowledge. It is done seeking support in Doll Jr. (1997) who characterizes two emphases, called verificationist and experiential epistemology. In the verificationist, knowledge is external to the individual and, as a consequence, does not conceive the existence of different learning processes resulted from relationships that each individual may have with knowledge. The method is to follow a pre-defined model of prescriptive actions.

The author concludes that knowing how to perform a task is, in essence, the very method called mechanical dimension of the didactic action. In this, the teacher acts “[...] respecting, faithfully and accurately, the steps that were predefined as indicative of better teaching performance in a methodology based on procedural skill” (GUÉRIOS, 2002, p. 184). On the other hand, on the experiential epistemology the individual is the center of a dynamic process of knowledge construction and not of confirmation or verification of knowledge, nor the teacher is fully submissive to a prescriptive model for the practice. The experiential epistemology considers the uncertainties and errors of students in the learning process. “This epistemological perspective allows, therefore, to accept the arising of the non-programmed, the unanticipated, because it is not possible to prescribe how the dialogical relationship between knowledge and the individual should be constituted” (GUÉRIOS, 2002, p. 19).

Corollary of this research, Guérios says that there is a linkage between the development of methodology in the classroom and the epistemological basis in which teacher education happens that, whether verificationist or experiential, reflects on the corresponding didactic posture. The author believes in a didactic performance that exceeds the mechanical dimension of the method and enables teachers to constitute themselves as autonomous individuals of teaching, while students could experience an autonomous and reflexive process of conceptual construction of curricular knowledge. Guérios (2002) states that the teaching practice is anchored in structuring principles that are implicit in the way that they and give movement (or not) to the methods and make them dynamic. The investigative principle is an example. If a teacher has internalized the research as a teaching principle, then the research will become the basis of their actions whatever the method and will have as an aim to develop, in the student, the investigative spirit. Likewise, if they have internalized reproduction and memorization as a principle, these will become the basis of their educational actions and the teacher will have a student resulting from this posture. According to Guérios, the teacher’s didactic strategy boosts the method that is, itself, static. The educational strategies may

be aimed at knowing to perform a task or that curriculum contents are to be conceptually constructed considering dialogical relations between knowledge and the individual and among individuals. It is an epistemological option.

Given the above, we set out to reflect on the pedagogical knowledge mobilization enabled by the interactive process, in view of the initial teacher education in the classroom learning modality with a focus on Teaching Methodology, using resources from synchronous and asynchronous communication.

The research methodology and its theoretical origin

In Guérios and Sausen (2012), we were primarily focused on the occurrence or not of curricular knowledge mobilization in a perspective of pedagogical practice on interactions established with the use of chat and journal. On the occasion, we observed that if the virtual and in-class spaces are used as articulated environments in the context of pedagogical practice, they can promote the occurrence of mutual and reactive interactions (PRIMO, 2008) and of the interactive dialogic characteristic perceived in face to face interactions and in the mediated interaction (TOMPSON, 2004). We noticed that such occurrences enabled the mobilization of curricular knowledge of the Teaching Methodology in Mathematics subject among students, as well as, in a personal sense, the mobilization among students to learn (CHARLOT, 2000; POLYA, 1995). We noticed that there is a reflective movement of learning, which we set out to study, and in this article we are focused on the knowledge mobilization enabled by the interactive process with the use of resources from the virtual learning environments with a focus on Teaching Methodology in initial teacher education. Based on Primo (2008) and Scherer (2005), we synthesized our understanding of interaction as a dynamic process in which the interagents' action are joint and the relationships established between them and among them and the knowledge are not linear, because we consider the particular characteristics of each

individual at different times and movements of learning. In summary, we have conceived interaction as the relationship between the individuals of learning (students with each other and with the teachers) and the relationship between the individual and knowledge (the environment and knowledge). In this sense, interaction and learning are closely linked and the evaluation is an element correlated to the process. Bairral (2007, p. 21) contributes to this understanding by considering “interaction, learning and assessment as three closely related fields”. He also mentions that “it is in the analysis of the interactive process that the tutor can get a variety of information to infer on the learning of his interlocutor”. Such positioning from the author is valid for us as we are dealing with the formative process in teacher education in which the methodology of teaching has centrality. Bairral (2007, p. 21) also states that this analytical process should be based on two dimensions: “the cognitive (attitudes, skills, beliefs, prior knowledge, thought processes, motivation, emotion) and social (collaboration, ways of sharing, several personal-professional relationships and the different contexts involved)”.

The collection of empirical data took place in three stages. In the curricular period that preceded our intervention, the syllabus contents were developed according to the schedule established annually by the teachers responsible. The first stage of the intervention occurred within the classroom space of the subject and students solved mathematical problems selected by the researchers. The goal was that students should be involved in the process of solving problems so that later they could discuss according to the theoretical references of the subject, the methodological process of solving problems. The second stage occurred in the virtual space with the use of the chat and journal. The goal was to observe whether students mobilized, in the interpretation and analysis of their own resolutions, curriculum theoretical foundations already taught in the subject, from the Solving Problem content as a teaching methodology in Basic Education. The third stage was again in the classroom space when students discussed their resolutions and deepened the theoretical discussions. The goal was to observe movements of learning in processes of mediated interaction by resources from Virtual Learning Environments

in Classroom Education, i.e., if, after the mobilization of knowledge in activities in VLE, there was conceptual learning of curriculum theoretical foundations. Next, we reflected on the results assuming that teaching methodologies for Higher Education in the classroom education can take advantage of resources from the virtual learning environments.

Mobilization of curricular knowledge in a perspective of pedagogical practice on interactions established with the use of chat and journal

Empirical data interpreted below refer to extracts from activities performed by the students subjects of study in the communicative spaces chat and journal. From the extracts selected, we had the participation of the students AJM, Darciano, Eli, Josa, Mi, Simone, Taiana, Vane, Vivi, the researcher Sandra, and Celine – teacher of one of the classes.

It must be mentioned that the students initially solved Maths problems in class, and after, in the virtual space using the chat, they discussed, in the light of theoretical references of the subject, the methodological process of Problem Solving by identifying them in their individual process of resolution and reflecting on them; back in the classroom, they discussed collectively the methodological process of their own resolutions and deepened the theoretical approaches they had accomplished. The purpose of this segment of the article is to observe the occurrence or not, of mobilization of theoretical contents of the Teaching Methodology in Mathematics course and not the conceptual explanation, by us, of these contents.

The first extract concerns the moment that students were arguing via chat curriculum theoretical contents of the course that were being identified in the process of their own resolutions. The steps of Polya for Solving Problem⁴ were on the agenda. At a certain point, the theore-

⁴ Polya presents four steps for Problem Solving in Mathematics: to understand the problem, to establish a plan for the resolution, to execute the plan, to make a retrospective of the resolution reviewing the trajectory percurred.

tical content of concept maps came into question, and AJM says: “[*concept maps*] are the simplest way to summarize with quality a desired subject”. Thereafter, they associated theoretical knowledge of concept maps with their resolution of problems and projected it to the educational circumstances in which this knowledge could be “used” in the future activity as teachers. AJM and Vane carried on a dialogue when AJM says that concept maps can be used “[...] in the reflection about the subject, rather than making a report or abstract, making a map with keywords”, followed by Vane: “We can ask students to draw up a map of things worked, strategies used, in the elaboration of the activity in question”. AJM: “It is a clash of ideas, where each person shows their idea, which is discussed as a group until they come to the most consistent idea”. Vane: “In my opinion, the concept map has nothing with the activity we did, at least in the way we performed it”. Vivi: “I agree with Vane”. Vane refers to the previous activity of solving mathematical problem.

It is very interesting to observe that the dialogue between AJM and Vane occurred in this interactive process, more than identifying the theoretical curriculum of the subject, it shows the occurrence of a movement of conceptual construction as a consequence of the relationship between theory (theoretical curriculum content) and practice (problem solving activity) experienced by them in situation of practice (activity in the chat). With a language proper of conversation among peers without worrying about the words, they show the development of a synthesis reflected. The terms “simplest way” and “summarize”, “but not only summarize but to summarize with quality”, are good examples. In the synthesis of AJM, concept map is a summary with quality. But what is “quality” for him? It is more than a report or summary. It is a reflection about the educational content whose conceptual synthesis will result in what he expressed as “keywords” – it is the conceptual manifestation of the term itself. Similarly, when Vane considers the “strategies used in the activity”, she makes clear that she is not concerned about listing the activities or contents, but about the learning process of students.

We have identified that students mobilized theoretical content of the course regarding principles of Ausubel’s theory on meaningful learning

(MOREIRA; MASINI, 2001) and Ontoria et al. (1995). Moreira and Masini claim that concept maps are two-dimensional diagrams that show hierarchical relations between concepts of a subject and that they derive from the existence of the subject itself. Also, that concept maps can be used as an evaluation tool – not in the sense of testing knowledge and assigning grades to students, but in obtaining information about a type of structure that the student builds for a given set of information and concepts. About the students' theoretical contents we observed that Ausubel's theory on meaningful learning was reference for understanding concept maps as cognitive strategy. The sequence of interactive movement on the chat, according to the extract below, shows mobilized theoretical knowledge and how students mobilized themselves to learn. We are in agreement with Charlot's statement (2000 p. 54) that the concept of mobilization subtends the idea of movement. "Mobilizing is to set in motion; mobilizing is to set yourself in motion". Charlot discusses the ideas of mobilization and motivation interestingly, whose subsidy for Teaching Methodology is unquestionable. "Mobilization involves mobilizing yourself (from inside), whereas motivation emphasizes the fact that it is motivated by someone or something (from outside)" (CHARLOT, 2000, p. 55). Without going into the theoretical discussion about motivation, this approach of Charlot associated with the positioning of Guérios (2002) that raises the experiential epistemology to the center of the methodological theory collaborate on the interpretation of the extract below, in which the researcher Sandra acted as mediator.

Sandra: *When you speak of reflection to what are you referring?*

AJM: *Debate on the subject in question. Formulating conjectures.*

Mi: *Discussion of how to solve.*

Sandra: *In what kind of learning?*

Vivi: *Yes, it is necessary to reflect so learning can occur.*

Mi: *Yes, reflection contributes a lot to learning, it allows one to make a record of everything that was done.*

Vane: *Meaningful learning according to Ausubel.*

Sandra: *Nice, Mi, and what else do you think you could do using concept maps? What made you remember Ausubel?*

Vivi: *Please answer, Vane.*

AJM: *Elizete [their teacher] meaningful learning.*

Sandra: *Besides Elizete.*

Vane: *Because we used the knowledge we had to solve problems, so we acquired new concepts or a broader knowledge about a particular subject.*

Sandra: *Could these activities be used with your students?*

Vane: *Yes, absolutely.*

AJM: *Meaningful learning, subsumer knowledge and such, by solving, the student acquires knowledge through effort and work, far more significant than the teacher presenting the content to the student.*

We noticed that in lectures, it was taught that to Ausubel, meaningful learning is a process in which new information relates to an important aspect of the structure of specific knowledge, which is defined by him as subsumer concept⁵, existing in the cognitive structure⁶ of the individual. Meaningful learning occurs when new information is anchored in relevant subsumers, preexisting in the cognitive structure of the learner. Being that, “[...] one of the main functions of the existing concepts in cognitive structure is to facilitate the acquisition of new concepts, more in the case of assimilation than in education” (MOREIRA; MASINI, 2001, p. 40). In contrast to meaningful learning, Ausubel presents rote learning, “[...] as learning new information with little or no interaction with relevant concepts existing in cognitive structure”. In this situation the new information is stored arbitrarily, having no interaction between the new information and the one already stored. It is noteworthy that Ausubel does not establish dichotomous distinctions between meaningful learning and rote learning, but analyzes them as a *continuum*. According to Moreira and Masini (2001, p. 17), “the most

⁵ *Subsumer* (anchor idea) – broader idea (concept or proposition), that works as a subordinator of other concepts in the cognitive structure and as anchorage in the process of assimilation. As a result of this interaction (anchorage), the subsumer itself is modified and differentiated (MOREIRA; MASINI, 2001, p. 108).

⁶ *Cognitive structure* – total content and organization of the ideas of an individual; or in the context of learning of a subject, the content and organization of the ideas in a particular area of knowledge (MOREIRA; MASINI, 2001, p. 107).

important concept in Ausubel's theory is the one of meaningful learning." Regarding the types of learning, Moreira and Masini (2001, p. 95) make distinctions between three types of learning. The first, cognitive learning is "[...] the one that results in the organized storage of information in the mind of the learner, and this organized complex is known as cognitive structure". The second type, affective learning, "[...] results from internal signals to the individual and can be identified with experiences such as pleasure and pain, satisfaction or dissatisfaction, joy or anxiety". Finally, the third, psychomotor learning, "[...] involves muscular responses acquired through training and practice". In fact, these knowledge are in the basis of students' statements.

We noticed that in the chat, students have established relationships between the authors studied, such as when Mi says that reflection allows making retrospect. Observing other speeches of the same student, it is clear that he is contrasting the theoretical ideas about meaningful and rote learning, although he does not mention them. He is also correlating with Polya, when using the term "retrospective" in the sense of an assessment resumed with progress made and with synthesis. By associating "reflection" with "retrospect" they are in the process of conceptual construction. Mi got mobilized to learning. And learned. The same happened to Vivi when she said that "reflection" is necessary for learning to occur. Same as AJM by saying "formulating conjectures", "meaningful learning", "subsumer knowledge". Same as Vane by saying that when you use knowledge that you already have to solve problems, you acquire new knowledge and expand the ones you already have. The interesting thing is that this process is triggered by the interaction on the chat.

On the next part we interpret the mobilization of knowledge held by Taiana when we ask: "what about the use of a calculator to solve problems... what do you say about it?". Taiana answered: "it helps a lot. [...] Because the student must know how to interpret what you're asking, the calculator will only make it easier to solve the sum". It is clear that Taiana considered the operational scope of this technological instrument without awarding it the success or not of the learning outcomes. The

expression *knowing to interpret what is being asked* meets the authors' idea about the use of a calculator in activities of problem solving. They say that anyone can calculate – even those students who have difficulties in performing calculations inherent in the use of pencil and paper, focusing on the process of solving the problem. The following extract, in which Simone's speech confirms Taiana's, reflects a process of reflection on the construction of a conceptual idea of a pedagogical icon: problem solving as teaching methodology. She said:

I believe that when the goal is not to calculate but, I don't know, types of strategies, or... the resolution itself, and not the math sums, basic operations or simple problems where the statement already says what to do, I believe they are problems that the student really have to think about, use, create strategies, develop various calculations to find the solution.

The expression “*but, I don't know*” denotes a time for thinking, a movement in which theoretical frameworks are being associated to deepen and conceptualize Problem Solving as Teaching Methodology with the expression “*the resolution itself and not the math sum*”.

Carrying on with the Problem Solving content, we present the following extracts taken from dialogues in order to visualize the students' understanding of the conceptual construction movement. Theoretical knowledge taught is mobilized, with emphasis on Polya (1995), Onuchic (2007), Butts (1997), Romanatto (2010) and Villella (2006).

AJM: *Problem solving is a method for introducing a new concept through the debate on an initial problem...where this problem will lie in the concept approached.*

Vivi: *Problem solving is a tendency of Mathematics Education to try to make Math classes more dynamic and interesting to students. I mean, problem solving is a methodology.*

Vane: *Problem solving is a teaching strategy that contributes to the teaching practice and it can arouse the interest of students by developing skills and math skills [...].*

AJM: *The student starts trying to solve a problem usually raised by the teacher; when seeing that students' knowledge is still insufficient, the teacher should then, from this moment, interfere, introducing a new concept...*

We present below an example of post on Eli's Online Journal that expresses his understanding about the process that she is experiencing. Eli says:

In relation to the first activities developed, it was very interesting because although during the lessons our knowledge regarding Problem solving was discussed based on the theory, in practice it is much color. Because, we thought of different ways to solve, we got excited thinking that we were on the way, when we got in the middle we found that the initial analyzes were not valid. Only in the second meeting we could visualize a changing in the condition that in the end was what supposedly made the thing happen...

We noticed that Eli considers the activity of identifying the curriculum content of the subject in the problem solving one as a practical activity. He mentions her excitement about following a path of resolution that actually means his satisfaction in solving a math problem. We observed that the post on the Journal allowed the teacher to check up on Eli's development, due to the analysis of the interactive process experienced by both.

Here is another situation in which the movement of knowledge mobilization in process of interaction in the chat and learning is visible. The knowledge in question are didactic and pedagogical contract. We noticed that, initially, the students had difficulty in understanding, according to Eli's words, being perceived the attempt to understand. Brousseau (2010) is mentioned, but not only him. Let us observe.

Darciano: *Didactic-pedagogical contract...*

Eli: *I do not know if it's exactly like...we read the last text, what was it?*

Darciano: *There was something there...*

Eli: *Yes, but it ended up confusing our ideas.*

Darciano: *I think so...*

Eli: *The didactic contract would be that which the stud... the teacher, say, on the first day of classes arrives and exposes the ideas, the way he or she will work, let's say, the tests, the works, what he or she will use, the way he will evaluate, things like these!?[...] Or is the pedagogical contract that is this idea?*

Darciano: *The pedagogical contract is the relationship between teacher and student.*

Celine: *hence didactic contract has to do with the math content...*

Darciano: *Yes [...] so didactic contract – relationship between teacher, student and content [...] The pedagogical – teacher and student.*

Interestingly, the discussion begins with the terms *didactic-pedagogical contract*. Darciano searches direction under the terms and says that pedagogical contract is the relationship between teacher and student, which makes sense to him in the sense that, certainly, expresses the term “pedagogical”. Although Eli claims that the text read just confused the idea, he is not intimidated nor gets comfortable and continues trying to organize his idea, doing it with consistency. When Celine introduces the relationship with the mathematics content, Darciano starts to think and relate it to the didactic contract, establishing didactic contract as a triad relationship (teacher, student and content) and pedagogical like a relationship between teacher and student. We are talking about movement of learning and this is what we showed in this fragment. The interactions occurred in the chat allowed such construction.

Final considerations

This article discussed the use of virtual learning environments in the classroom learning modality in higher education and investigated the mobilization of pedagogical knowledge, in a learning perspective, made possible by the interactive process, with the use of synchronous and asynchronous communication resources. We noticed that such mobilization in the virtual environment may be a structural element of teaching methodology for higher education in the classroom learning modality.

We observed that in the activities in the Virtual Learning Environment there was interaction among students, among teachers and students and between students and knowledge, there was also mobilization of curricular knowledge by students and mobilization of students to learn. In summary, there was an interaction, there was mobilization, there was mobilization to learn and there was learning. This learning was conceptual and resulted from the relations that students established with knowledge in the interactive process. There was no prescription and training. There was guidance and monitoring on the activities.

We adopted as pedagogical principle the Methodology of Teaching in an epistemological perspective that considers the multiple relationships between the individual and knowledge and because in it, it is not possible to prescribe how the dialogical relationship between knowledge and the individual should be constituted, we see the student at the center of a dynamic process of construction of knowledge. Accordingly, the data showed that the use of Virtual Learning Environments in traditional classroom education enables the development of teaching methodology focusing on building conceptual knowledge, where there is guidance and basis for the methods, but not the prescription for the thinking of students.

The results indicate that the use of virtual learning environments in classroom education favors the teacher to a didactic performance in which students experience an autonomous and reflexive process of conceptual construction of curricular knowledge.

We believe that the integration of ICT in the educational process in higher education can help the professor on the composition of their methodological processes, which in turn can help students build their thinking and corroborate to interesting learning outcomes. We believe that the virtual and in-class environments can be used as complementary and articulated spaces in Higher Education. We think that the Teacher Education (initial and continuing) Courses in the classroom education modality can take advantage from the use of resources of virtual environments to build educational strategies

aiming at a pedagogical practice anchored on the fundamentals of an experiential epistemology that considers the relationship between the individual and knowledge.

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