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Keyword: Distance Education; Meaningful Learning; Mobility.

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The Mobility of Professors in Performing Distance Education Activities

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Abstract

The article investigates the strategies used by Distance Education (DE) tutors to mobilize students in carrying out the activities available in the Virtual Learning Environment. To reflect on the mobility of tutors, learning theories outlined for Distance Education were revisited. The methodology consisted of a study applied at a university in southern Brazil. As a data collection instrument, a questionnaire was developed and applied to a group of tutor professors who work in DE. The testimonies obtained were analyzed to show the strategies used to mobilize students in the perspective of meaningful learning. The analysis showed that the terms mobilization and motivation are used interchangeably; the dimensions of meaningful learning (active, authentic, cooperation, constructive and intentional) are used to mobilize students, but not all dimensions have been captured in digital reports. This can be indicative of prioritizing one dimension over another. It was concluded that further investigations should be carried out to demystify the tutors strategies regarding learning theories.

Keywords: Distance Education; Meaningful Learning; Mobility.

1. Introduction

Distance Education (DE) is a teaching modality where the actors are spatially and/or temporally separated and carry out their studies, either synchronously or asynchronously, through the resources available in the Virtual Learning Environment (VLE). The resources available at VLE, together with the support of Information and Communication Technologies (ICT), favor the construction of new knowledge, autonomous study and the network of cooperation and collaboration between human agents (student-professor, student-tutor, professor-tutor).

DE was introduced in Brazil in the mid-1990s and emerged from the demands of autonomous learning, allowing studies to be carried out in any location and at any time, thus providing an opportunity for a broad and continuous process of changes in the educational sector. The proliferation of DE has intensified due to

the existing difficulties in urban mobility, international mobility, needs for time optimization and autonomous study. Over the years, this type of teaching that revolutionized education, was mediated by different media resources, including writing by correspondence, television, printing technology, Internet and ICT.

As described in [1], the Distance Education in higher education began more than a century and a half ago in the United Kingdom, when the University of London created its External System in 1858, or correspondence courses.

As time went by, new forms of intermediation were adopted, such as television (*Telecurso*) and the Internet. Education started to be offered with different purposes: initial and continuing training, professional or pedagogical training. In this sense, over the years, several Higher Education Institutions (HEIs) in the country have joined this movement. In Brazil, according to information from the Ministry of Education Portal (e-MEC) system, in July 2018 there were 571 accredited HEIs, with higher education courses offered in the Distance Education modality.

Research data of [2] demonstrate that higher DE in Brazil had, in 2004, around 60 thousand students enrolled; it grew rapidly and reached the mark of 1.5 million enrollments in 2016, offering important collaboration for the development of the country.

With the expansion of the number of enrollments in DE, there are motivations to know how professors do network education from the experience of a permanent and continuous intertwining between the biological, the social and the cultural, as taught by Maturana for “[...] individuals in their interactions constitute the social, but the social is the medium in which these individuals are realized as individuals, [...] there is no contradiction between the individual and the social, because they are mutually generative” [3]. Here stating that the autonomous, self-producing living being, which was not created to receive information passively. The concept of Network used in this article refers to the symbol of science for our century because it represents “The only organization capable of growth without prejudice and learning without guides [...] No other scheme - chain, pyramid, tree, circle, axis - can contain true diversity functioning as a whole” [4].

The Network metaphor does not presuppose previous structures, plastered, ready to imprison reality. We are dealing here with networks of relationships produced by the relationships themselves, these helpers and helpers, as Morin reports [5]. Perceived as threads that emerge and that are self-organizing at each moment subject, therefore, to unpredictability.

Despite contributions and experimentation with other processes from different researches in DE, we are still looking for ways to understand and intervene in the dynamics of network learning. Today, the creation of a more organized and systematic interactive space, conducive to the articulation of different activities, still makes us question the possibilities of networked education and its *hominization* potential.

For Lévy [6], the *hominization*, the process of the emergence of mankind has not ended, but it is accelerating in a brutal way. However, contrary to what happened at the time of the birth of our species, or at the time of the first great anthropological mutation (that of the Neolithic, which saw livestock, agriculture, the city, the State and writing), we now have the possibility to collectively think about this adventure and influence it [7].

The purpose of this article is to reflect on the professor's mobility in a VLE, with learning as the central focus. The research methodology consisted of a case study [8] held at an accredited University to offer

courses in the DE modality. As a data collection instrument, a questionnaire was developed and applied to a group of tutor professors who work in DE. The testimonies obtained, in the form of digital reports, were analyzed to show which strategies were used to mobilize students. To reflect on the professor's mobility, that is, what does it perform a certain action; that moves it in a VLE, the theories of learning have been revisited, in particular, the meaningful learning outlined for DE.

It is important to note that the author Charlot [9] distinguishes the idea of "mobilization" from the idea of "motivation". For him to mobilize implies getting involved ("from the inside out"), while the motivation depends on the stimulus provoked ("from the outside in"). Thus, mobilization is more directed to the dynamics of the subject/educator's own movement. For the author "to mobilize is to" put resources in motion "to assume an" activity originated by mobilities", because there are good reasons to do so" [9]. The mobility is the desire that will trigger the activity.

In the perspective described above, the author Morin [10] highlights the fifth knowledge for the education of the future, the need to "Face Uncertainties". The certainty of historical progress, the idea that prevailed in modern civilization, destroyed the myth of the right, giving rise to the awareness of uncertainty considering "the speed and the acceleration of the complex and random processes of our planetary [...]". Although the sciences have guaranteed many certainties, they have also revealed many uncertainties, showing the importance of education to teach the uncertainties present in the physical, biological and historical sciences.

When feeling mobilized, both the professor and the student seek to innovate their practices. According to Morin [5], based on complex thinking, from a systemic perspective, we cannot dissociate internal mobilities from external ones. There is a process of interdependence between them. The professor's knowledge is mobilized in the midst of the school's daily interactions, "the knowledge that comes from it, in one way or another, and serves to solve the problems of professors in practice, giving meaning to their own work situations" [11].

But what about the student? How can the professor and / or tutor mobilize the student participating in a distance education course to carry out certain learning activities? These questions are the guiding principles of this research.

Meaningful Education to Mobilize Students

Based on the assumption that the learning theories adopted for the design of the pedagogical model are essential to activate mobility resources, as they will provide all the conceptual and practical basis for the construction of a flexible pedagogical architecture (regarding the contents, strategies, methodologies and resources technological), adaptive and oriented to the context of the student. For the design of architecture, with such characteristics, the pedagogical team works with a hybrid approach, looking for devices in different learning theories.

Resende [12] highlights the existence of several learning theories applicable to DE and argues that those based on constructivist principles with interactionist conceptions are the most significant, since learning is largely carried out in VLE. Meeting with the author [12], we consider that the combination of both theories (constructivist and interactionist) are relevant to DE, since access to VLE resources occurs through

interactions with the virtual learning objects themselves and with human agents and these interactions collaborate to activate internal mobilities and external.

For Ausubel [13], learning from a cognitive perspective includes a diversity of theories, including the theory of form; theories of information processing; cognitive-structuralist theories; Piaget's theory that brings structuralist and organicist roots despite emphasizing more development at the expense of learning processes. The cognitive theory proposed by Piaget, treated in an interactionist perspective, explains human cognitive development, where man and the world are analyzed collectively [13].

For Pozo [14], Piaget and Vygotsky were the main proponents of contemporary constructivism. For Andrade [15] the concepts of knowledge construction proposed by Piaget can be applied in different aspects of human learning and for Rezende [12] the socio-interactionist conception proposed by Vygotsky highlights the importance of social interaction in the educational process, through the subject's exchanges with the other and with the social object.

Constructivism is a learning philosophy that describes what it means to know something and what is reality. Traditional conceptions of learning admit that knowledge is an object, something that can be transmitted from the professor. Constructivists, on the other hand, believe that knowledge is a human construction of meanings that seeks to make sense of their world [16].

The human construction of meanings is emphasized in meaningful learning, a theory based on the cognitivist conception, proposed by Ausubel [13]. This theory, also called the assimilation theory, seeks support in Piaget and Vygotsky's cognitive conceptions to explain the internal mechanisms that occur in the human mind in relation to learning and the structuring of knowledge. For the authors [17], Ausubel's theory of learning values the participation of mental processes in learning and emphasizes the importance of considering students' prior knowledge to build mental structures in order to seek new knowledge.

In the author's view [16], DE must emphasize in its teaching-learning process the relationships between the multiple dimensions that collaborate for meaningful learning, illustrated in Figure 1.

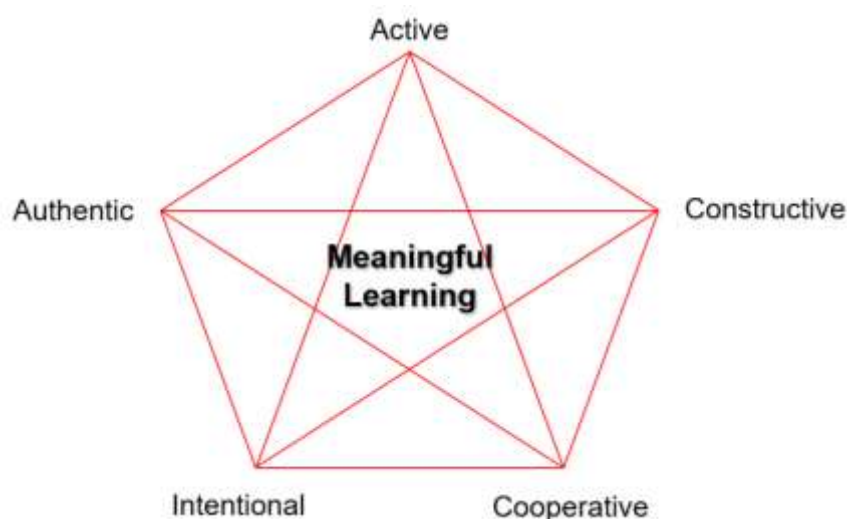


Figure 1 - Dimensions of Meaningful Learning [16].

For Salles [18], some authors dealing with the theme of multiple dimensions of meaningful learning, such as Ausubel [13], Jonassen [16] and Santos [19], claim that when the student learns something new, he

incorporates all of his previous baggage into that experience. The new information assimilated is processed forming a growing network of data that will assist the student in the interpretation of a given situation and application of the knowledge acquired in similar situations.

Chart 1, built on the basis of research carried out by Salles [18] presented the multiple dimensions of meaningful learning, its characteristics and how the construction of knowledge occurs in the view of different authors.

Chart 1 - Systematization of the multiple dimensions of meaningful learning.

Dimension	Characteristics	Meaningful Learning	Author
Active	Manipulative and observable	- Active manipulation of information from knowledge objects in the VLE.	[20][16]
		- Genuine experiences from interactivity.	[21]
		- Reflection on the information processed, from the manipulation and interaction with the tools made available in the VLE. - Relationship of processed information with previous knowledge and experience. - Interpretation and meaning of information, generating new knowledge.	[22]
Constructive	Articulatory and reflective	- Active subject in the knowledge process. - Constructive, reflective, collaborative, interactive relationship in autonomous moments of learning. - Confrontation of previous knowledge with new historical and cultural contexts.	[23]
		- Construction of interpretations of the phenomenon manipulated through observations.	[16]
		- Acquired knowledge is produced internally as a mental and individual construction involving the relationship between existing knowledge and new knowledge.	[14]
		- Interactivity involving relationships between virtual learning objects, subjects with diverse experiences and pedagogically organized activities. - Autonomy through shared relationships. - Appropriation and reconstruction of knowledge through interactivity, sharing and reflection of experiences.	[24]
Intentional	Reflective and regulatory	- Learning oriented to students' objectives and goals. - Learning favored through investigation, analysis of information and the exchange of knowledge and experiences aimed at expectations and goals. - Permanent learning process that points to education as a source of knowledge and an object of transformation.	[20]
		- Intentional practices that encourage the student to analyze the acts practiced in daily life. - Diversified practices, methodologies and tools provide behavioral changes based on the acquisition of new skills, knowledge, concepts and attitudes.	[25]

Dimension	Characteristics	Meaningful Learning	Author
		- Reflective skills exercised in problem solving contribute to the construction, reconstruction and reframing of knowledge applicable in practice, causing behavioral changes according to the situations that occur in daily life.	
Authentic	Complex and contextual	- Development of contextualized educational processes, which present complex and real problems, stimulating the student's ability to use thinking to work on poorly structured problems. - Presentation of actions that simulate significant real-world situations, with useful, new and different contexts, helping the student to apply these concepts. - Learning and problem solving must provide social activities linked to the student's context. - Appropriation of different views of the world and with other complexities, provided by the communities of the VLE, composed of members from different cultures and with different perceptions of reality.	[20][16]
		- Relationship of knowledge with the reality of the student allows the improvement and construction of new knowledge from the information raised and problematized in their daily lives.	[19]
Cooperation	Collaborative and conversational	- Collaborative work with social negotiation, common expectation, understanding of the activity and methods adopted for its realization. - Collaboration between peers through the exchange of experiences. - Reflective thinking in the constructivist environment allows the rescue of individual experiences and the sharing of experiences with the group. - Relationship groups provide knowledge of different interpretations and perceptions between peers.	[16]
		- Knowledge sharing through VLE's technological resources. - Construction of a horizontal social space rich in information sources, which, when making sense, can produce new knowledge and, consequently, new actions. - Application of collaborative activities in VLE collaborates with autonomous and collaborative, critical and creative study. - Establishing relationships between information received from social interactions and VLE resources.	[25]

Source: Adapted from [18].

The communication network provided by the VLE must foster cooperation and collaboration between peers, so that new knowledge can be built based on the experiences lived, in this way the interactions provide the social construction of knowledge.

The virtual environment must be provided with mechanisms capable of capturing the students' prior knowledge, their interests and objectives, because thus, the VLE resources can be adapted to the context,

providing the student with intentional and authentic activities, tools and methods, appropriate with the your reality. In addition, the mechanisms must be able to follow the evolution and progress of the student, in view of the proposed activities. This functionality allows the alternation/adaptation of the proposed contents and activities aimed at meaningful learning.

In DE, caution is needed regarding authenticity in the teaching and learning process, as according to Jonassen [20] "Instruction, very often, tends to oversimplify ideas in order to make them easier to convey to students. This process assumes that the world is a simple and reliable place". According to Salles [18] complexity, a component of learning addressed by the author represents the need for the professor to develop educational processes that present complex and real problems, in order to stimulate the student's ability to use thinking to work on poorly structured problems". This dimension of meaningful learning must be carefully evaluated in the design of the DE system, as there may be a natural tendency in the simplification of educational processes so that the student can proceed with the autonomous study and achieve their goals.

According to Charlot's proposal, "teaching with meaning to mobilize students" is the most appropriate way for emancipatory education, because "the more significant what is being taught, the more the student starts to move, mobilizes to relate to that content" [26].

Significant Learning for the Mobilization of DE Students: With Tutors Speaking

The case study was used as a research strategy, with the application of the following guiding question: "What are the mobilization strategies used to carry out the activities proposed in the VLE (Virtual Learning Environment)?".

The question was sent to the group, composed of eleven tutoring professors from a University located in the interior of the state of Santa Catarina, in southern Brazil. Only five professors returned to the invitation and participated in the research, and the respective answers were provided via digital reports. The reports of professors 1, 2 and 3, presented below, have similarities in terms of mobilization and motivation.

Professor 1 reports that the messages in the chat and in some cases through information/requests made on the murals of the rooms (in the case of courses offered as semi-face-to-face) are the strategies adopted to mobilize the students.

For Professor 2, mobilization occurs by sending messages via VLE, e-mail and through sporadic visits in classrooms (courses offered in the semi-face-to-face modality). He complements saying that the student is congratulated for the dedication and participation, sending messages of self-motivation and stimulation to create a participation routine, not only of the activities, but of forums and the "talk to the tutor" channel. Professor 2 concludes that there is an incentive in organizing meetings with students to exchange experiences in the development of the discipline.

Professor 3 says that the strategies consist of the development of activities so that they seek to solve them collaboratively, thus seeking to exchange information with colleagues. Sending e-mails alerting you to deaDEines and face-to-face conversation helps with mobilization. A brief explanation of the contents covered facilitates learning a lot, for students who come to us in the physical space of DE at the Higher Education Institution.

Figure 2 summarizes the accounts of professors 1, 2 and 3, as well as the dimensions of significant learning adopted to mobilize DE students.

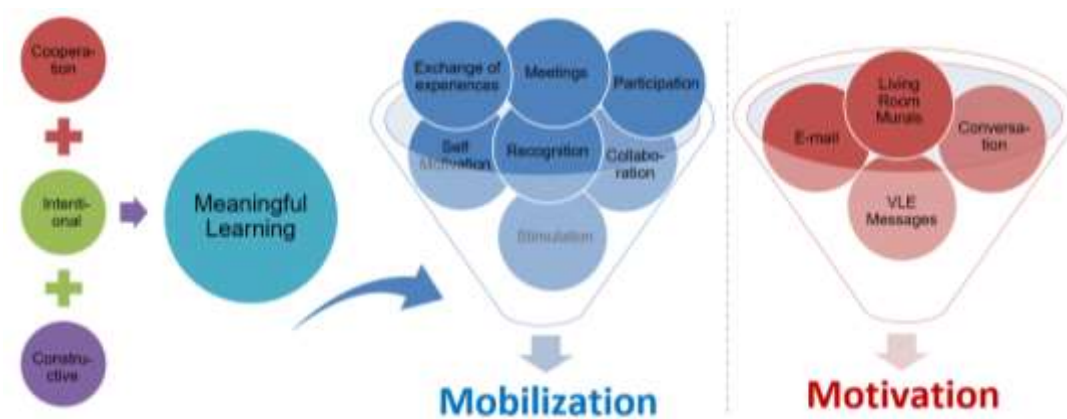


Figure 2 - Perception of Professors 1, 2 and 3 regarding the mobilization strategies.

Through Figure 2, it can be seen that some “motivation” strategies were classified by professors 1, 2 and 3 as being mobilization strategies, thus showing that there is still some confusion between the concepts of motivation and mobilization, seen as synonyms. This evidence needs an in-depth investigation with the entire team of tutors from the Higher Education Institution's DE, because although in a systemic perspective, we cannot dissociate internal and external mobilities, the concepts are specializations and not generalizations.

It is not too much to resume here the concepts mentioned above to distinguish them. Charlot [27] clarifies that “to mobilize, however, is also to engage in an activity originated by mobilities, because there are good reasons to do so”. Concerning the desire to do something. Motivation, on the other hand, is as if the professor had to present (something) as a reason, to provoke learning. This is because “many times, this act of motivating is the same as involving the students so that they do something they are not in the mood to do” [28]. On the other hand, the concept of mobilization suggests a relationship for the subject to start moving.

Through reports 1, 2 and 3, it was evident that professors use the constructive, intentional and cooperation dimensions as meaningful learning strategies to mobilize students in carrying out VLE activities.

The use of messages (encouragement, congratulations and self-motivation) are strategies to create the routine of participation and motivation in the VLE and according to Jonassen [20] we believe that such strategies are intentional practices oriented to the objectives and goals of learning.

Cooperation appears in the formation of groups to exchange experiences between peers. For Jonnassen [16] this strategy provides knowledge of the different interpretations and perceptions between peers. And in these discussions between the groups, meaningful constructive learning can occur when there is a confrontation of previous knowledge with new historical and cultural contexts [23].

The report of professor 4 (summarized in Figure 3) describes that the mobilization strategies consist of keeping them in constant performance of exercises and assessments, with different formats, in order to set them up so that they engage in different modalities of assessment and digital tools, because there are good reasons. For him, DE goes far beyond simply motivating the academic, as it is necessary to mobilize them

so that the activities take place, being instigated by contact with the tutor, solving their doubts, as well as guidance on the use of proposed digital tools and, thus, allow the activities and the learning and knowledge of digital tools to be effective.

The professor adds by saying that the diversification of the proposed activities collaborate for the mobilization, including, participation in discussion forums, making videos, written productions, use of various digital tools, such as infographics, the use of Google Forms for conducting research, as well as Google Slides, to expose your data, among others.

In the report, from one of the teachers, strategies are used based on the dimensions of cooperation, active, intentional and constructive (Figure 3). Through the report it was observed that there is an intentional diversification of practices, methodologies and tools, this diversification causes changes in behaviors from the reach of new skills, knowledge, concepts and attitudes [25]. The occurrence of the active dimension is identified with the student's instrumentalization for the active manipulation of information from the virtual learning objects of the VLE [20] and [16].

The constructive dimension and cooperation are observed in the report when the student acts as an active subject in the creation and production of learning objects, because in these constructions there is a reflexive, collaborative and interactive relationship in autonomous moments of learning [23]. Cooperation is strengthened when the student shares knowledge and performs activities collaboratively with VLE resources [25].

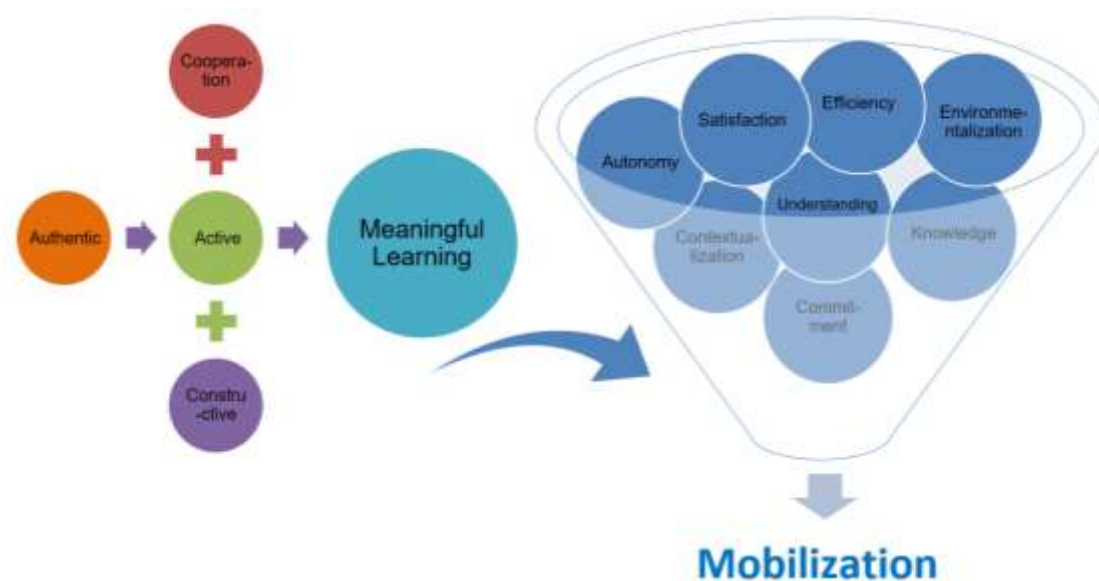


Figure 3 - Professor 4's perception of mobilization strategies.

Professor 5 reports that initially the motivation is required for the virtual student understands why the discipline and content proposed are interesting to him. After the student understands the importance of the content, the proposed activities are directed so that they can relate it and apply it in their day to day or in their future profession. Once this context is understood, the student has an interest in learning, discovering new things and keeping up with his classes. At the beginning of the journey this student is getting used to the content, the environment and learning to organize. After the period of knowledge of the learning

environment, the student is interested in keeping his activities up to date, as he learns the importance of completing classes on time and doing the work in a more efficient way.

Here the question of the internal dynamics (from within) of each student can be perceived, which starts to move by its own resources [9]. This movement is caused by different mobilities, the main one being the desire to move forward, the engine of mobilization.

He learns that the learning process depends 85% on him alone, on his ability to self-manage time and set aside quality time to build his knowledge. The professor concludes by saying that the satisfaction of the virtual student, once he puts the discipline as a goal, is indescribable. Having the feeling of reaching the goals, completing the activities and being able to maintain the line of reasoning is satisfactory and gives even more encouragement to study.

In Figure 4, strategies from the intentional, active, constructive and authentic dimensions are used. Self-organization of time, achievement of goals and objectives are characteristics of autonomy that contribute to the student becoming the active subject in the knowledge process [22]. These characteristics are intertwined in the active and constructive dimensions of meaningful learning.

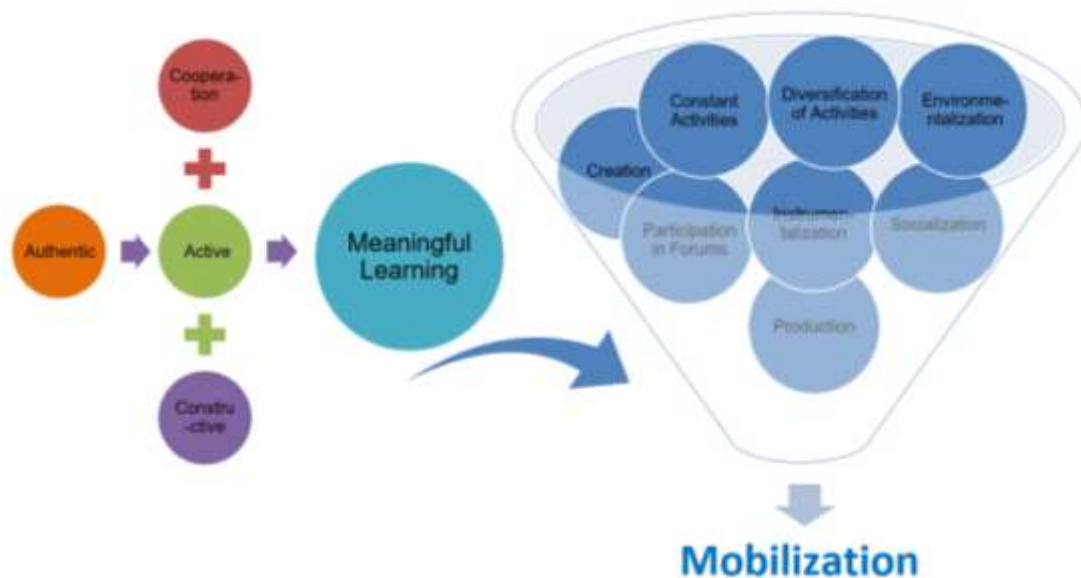


Figure 4 - Professor 5's perception of mobilization strategies.

In this sense, the subject performs reflections and associations of the contents and activities, since the intentional practices stimulate the student in the analysis of the acts practiced in their daily life [25]. In a complex and contextual approach to authentic meaningful learning, the relationship of knowledge with the reality of the student allows the appropriation and construction of new knowledge from the information raised and problematized in the student's daily life [19].

Charlot [27] highlights that in the relationship with knowledge there is an inseparability between meaning and learning effectiveness, that is, the subject only learns if it makes sense to him. In short, meaning is produced by establishing a relationship, within a system, or in relationships with the world or with others [9].

Final Considerations and Perspectives for Research Continuity

The study carried out here consisted of highlighting the mobility of a team of tutoring professors with a focus on learning at VLE. The results obtained were analyzed from the dimensions of significant learning. If, on the one hand, the analysis of the reports allowed to show that the concepts - "motivation" and "mobilization" are used as if they were synonyms, by some of the tutoring professors, on the other hand, it was possible to show that the construction of activities and the mobilization strategies are based on meaningful learning. However, two aspects deserve reflection for further research:

- 1) Reflection on the use and application of terms (mobilization and motivation), through an exploratory study with the instructional design team and professors from the University DE under study.
- 2) The analysis of digital reports allowed us to highlight the five dimensions of meaningful learning: active, authentic, cooperation, constructive and intentional. However, not all dimensions could be captured in all digital reports. This can be indicative of valuing or prioritizing one dimension over another. We therefore have evidence that research must continue to demystify the practices and strategies of tutors and/or instructional design staff regarding learning theories.

It is also important to remember that the concept of meaning presented by Charlot [9] involves ways for the subject to relate appropriate knowledge to relations with the world, with the other and with himself. In this perspective, the knowledge that enables us to understand life itself makes sense.

Thus, the mobility of professors in carrying out distance education activities will always be the discovery of relationships built with meaning during the learning process. The professor as a mobilizer of activities will be the mediator of networks of meanings that the subject is appropriating to make sense of what he is learning.

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