The quadripolar model applied to technology-mediated education information and communication: an empirical study

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The understanding of the education phenomenon, mediated by information and communication technology, goes beyond the cultural, political and economic precepts which guide the principles and fundamentals related to traditional education. The Traditional education, with its rigid didactic-pedagogic organization and with spatial and temporal structure limited to the use of available physical infrastructure, has difficult in making it flexible and extending the actions of education. However, since the phenomenon of distance education, mediated by information and communication technology, is founded in paradigms that measure the learning process under the perspective of distance education. Therefore, the Distance Education stands as a viable alternative to face this contemporary education challenge of breaking the barriers of space and time.

It is the conception adoption of education in centered school function – the school goes to the student wherever he is, with the flexibility of learning conditions and the fundamentals and self-study, in the independent and supervised study respecting everyone's pace (MAFRA, 1998). Moreover, it democratizes the access to education to a significant number of people who are not assisted by education in classroom mode. For Lobo (1991), distance education is a strategic to expand access

to education, once it should settle and deepen the pedagogical project commitment with the historical, social and political project of a nation.

This way, it will be thought that the contributions which an institutional model of distance education, via web, implemented in a Public Institution of Higher Education bring to settle and strengthen its educational policies. Contributions to Distance Education – EAD are important to overcome social obscurantism forged in the absence of access opportunity to education of a meaningful portion of society by offering graduation courses, post-graduate courses and continuing education. One also has to think of the expansion of new frontiers of knowledge on the issues related to the models application of education mediated by information and communication technology, especially regarding its structure and operation, from the definition of methodological guidelines and interdisciplinary content of the curricular subjects to the application of multimedia resources, consistency analysis of the teaching material and even the insertion and application, via a virtual learning environment.

In this context, the contributions of this study are relevant in two respects: in the point of view of evaluating the performance of system management for web-based Education and also, as regarding the scientific knowledge application based on systems theory and quadripolar method approaches to research and explain the education construct mediated by information and communication technology.

Based on this scenario, it is where it renders the research on the distance education model mediated by information and communication technology in the State University of Goiás (UEG), Brazil, centered on the construct of quadripolar method approach to and the standpoint of systems theory. In this context, the objective of this research is to deepen the understanding of the relationship between education technologically mediated and the *performance* of distance education system via the UEG website, looking forward to contributing to the advance the knowledge of Information and Communication Sciences and verify how the elements that make the paradigms of education, mediated by technology, relate to the performance of the distance education system via web in the quoted university.

Research problem and objectives

The paradigms of education, mediated by information and communication technology, related to distance education issues, show some association with the performance of the distance education system via web?

This being the basic problem or question of our research, we set as general goal, already expressed above, and specific objectives that should be specified:

- Analyze how the paradigms of education, mediated by information and communication technology, are perceived by students of education distance via web;
- Analyze the application effects of the paradigms of education, mediated by information and communication technology in distance education system in UEG;
- Check how the elements that make the paradigms of education, mediated by information and communication technology, relate to the performance of the distance education system via the UEG website;
- Identify aspects of the paradigms of education mediated by information technology, which may be the object of improving the management practices of the Distance Education system, object of this study.

The quadripolar dynamics: from the method to model

Based on the scenario above, it's tested something waiting to be done after three Canadian authors linked to the Education Sciences adapted to this scientific field little known proposal, though not completely ignored, of three Belgian authors and published by accredited Presses Universitaire de France (PUF) in 1974 – the proposal of a post-positivist and holistic method thought to qualitative research in Social and Humans Science[1]. And what was just waiting to be done was converting the model

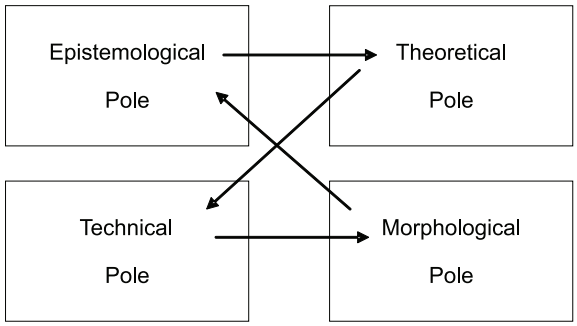
1 With four poles: the epistemological; the theoretical; the technical; and morphological. The investigation process develops because, from a structured field these four poles or different methodological instances , which undergo to their own requirements, without constituting at separate times, before articulating each other at every stage of the achieved research (extracted view

application to a strategic construct – the Distance Education System – the building blocks of the quadripolar methodology.

Indeed, in 1990, these Canadian authors published *Recherche qualitative: fondements et pratiques*, translated into Portuguese and published in 1994 by the Instituto Piaget (LESSARD-Hébert, Goyette & BOUTIN, 1994). The preface which presents the work emphasizes that the authors have endeavored to bring a deep and serious discussion to the problematic qualitative methodology, contradicting the common notion that scientific activity which explores social and human problems is a "journalistic" activity, "second hand" or even set aside under the pretext of having not yet demonstrated its "scientific credibility". In the introduction the authors begin by just saying that they cared about the methodological issues aroused by qualitative research in education. And in the search of more effective and efficient responses they braved the epistemological debate, urgent in this field, fetching the three Belgian authors an analysis grid that allowed them to organize, regulate and improve the data on the qualitative approaches gathered during the literature review: this grid is therefore based on a general model of understanding the methodological investigation. This is the quadripolar model, in other words Paul De Bruyne, Jacques Marc De Schoutheete and Herman (1974) conceived the methodological practice as a designed quadripolar space in a particular field of knowledge. They stood at the level of a general methodology, getting themselves more by the guidelines rather than inscription for the instrumental and technology or logic perspective, and that reduce a number of research procedures or linear steps (like the seven stages of QUIVY; Campenhoudt 1998: 30).

of the back cover – DE BRUYNE; HERMAN, Jacques; DE SCHOUTHEETE, Marc, 1974).

Figure 1 – The Quadripolaridade of a method designed for essential qualitative research in the Social Sciences, in whose broad field of Information Science is inserted



Source: SILVA 2002; 29

Before the Canadians, the book of De Bruyne and colleagues had already attracted the curiosity of researchers and editors who translated and published in Brazil (DE BRUYNE, HERMAN, DE SCHOUTHEETE, 1977), reaching the fifth edition in 1991 with the translated title literally from the French edition: Dynamics of social science research: the poles of methodological practice (Rio de Janeiro: Francisco Alves). This sign of interest in the quadripolar proposal culminated in the recent publication of an investigation manual of two Brazilians college students, Gilberto Andrade and Carlos Renato Martins Theophilus designed for the Social Sciences (Martins Theophilus, 2007). In the introduction of the manual the authors speak of a "paradigmatic model" and underline something that is fundamental to realize the importance and originality of the quadripolar proposal by De Bruyne and colleagues: the complexities involved in Applied Social Sciences prevents that the investigation is not reduced to a sequence of operations based on procedures or immutable steps. On the contrary, the construction of scientific work requires interpretations and constant twists among different instances of the various poles. Gilberto and Carlos Martins Theophilus (2007) to the four known poles decided to add two more – methodological pole and assessment pole – in a didactic excess that is not justified, but that will be discussed here (Martins; Theophilus, 2007: 4 ff.).

The advantages of a quadripolar methodology stem from the post-positivist thought, systemic and constructivist that underlies it and ought, therefore, to dwell in a little about the philosophical basis of this relation with the need to build a flexible and holistic model that can be applied to EAD.

The General Systems Theory revolutionized the way of knowing and understanding the social phenomena. Firstly it is seen as the counterpart of logical thinking, which its foundations are in Cartesian principles of evidence, analysis, synthesis and enumeration in representation as the sum of its parts that form the whole. However, the systems theory with its principles based on concepts that are the whole is not the simple sum of the parts, revolutionizes the way of thinking about the social phenomena. The chain of systems theory holds ideas contrary to Cartesian dialectic, where the whole is represented by the set of parts and their relationships and interactions between each other and the environment (BERTALANFFY, 1975; CHURCHMAN, 1971; CAPRA, 1999, VASCONCELLOS, 2007).

Thus, the systems thinking is formed by the analytic understanding of the set of interrelated parts that constitute a dynamic process of interaction between several divisions that have a certain phenomenon. In systems thinking we seek to understand a phenomenon from the whole it represents and not by the behavior of its parts, therefore being an antithesis to Cartesian thought where the laws that govern the behavior of the whole are considered fundamental (RAPOPORT, 1976, p. 27). LE MOIGNE quoted by Viegas, 1977, p.8-23,) shows a parallelism between the Cartesian and systemic vision that depicts this dichotomy.

However, the duality between the Cartesian thinking and systems thinking as a way thinking educators, presents itself as a barrier to understanding the educational phenomena in modern organizations, especially when it comes to Distance Education.

The universe of modern organizations has its genesis in the model of Cartesian thought. Hence, to materialize the educational processes in prescriptive logic models, founded on the precepts of traditional education blocks the capacity of professionals in education understand the world of distance education through the prism of abstraction.

Thinking distance education through the prism of a dichotomy – the systemic or Cartesian dialectic – transcends the perspectives of understanding the educational phenomena, therefore, proceeding this way directs the mind to the understanding of different realities in specific points of views. The logical model (Cartesian) describes the reality of the parties without encompassing the whole, therefore, is reductionist; the systemic model, however, extends this coverage to the vision of the whole. But the two approaches often do not make it possible to designed operational models due to the inability of educators to understand and build the relationships and interactions of the referenced phenomena, either by logical description or cognitive abstraction

of an observed reality. Constructs are riddled as centered bias in logic thinking with the noun (the reason) or form abstract thinking as the verb (action) to design their models of education management. Approaches to education and its main currents trend of thoughts give rise to this duality: positivism versus constructivism. However, it is mister understand these methodological differences of this duality between the Cartesian dialectic and systemic for proper understanding the phenomena related to traditional and distance education.

Table 1 – Cartesian Vision and systemic vision: a parallel

CARTESIAN PARADIGM	SYSTEMIC PARADIGM
EVIDENCE: a clear and distinct idea makes it possible to eliminate doubt. ANALYSIS: reductionism: it all comes down the sum of its parts. SUMMARY: causality: conduct in order the thoughts, even supposing order among those that are not naturally followed. LISTING: completeness: do so complete reviews that are safe of nothing have been omitted.	RELEVANCE: any object only defined in terms of intentions implicit or explicit on the subject about it. GLOBALISM: any object to be known should be seen as part of a larger whole (the environment). Prior to seeing its internal structure, which verify the functional relations with the environment. TELEOLOGY: purpose/goal: interpret the object not by itself, but by their behavior and by projects the subject in relation to it. AGGREGATIVITY: get variables that interest to the subject, as it impossible to exhaust the knowledge about the object, knowing beforehand that every representation (model) is simplifying.

Source: VIEGAS (1977, p.8-23)

They are, however, complementary scientific methods in the construction of educational models. While systemic social approach, by its interpretation of interactions and organic certain phenomena, seeks to understand the whole and allows the construction of abstract models that demonstrate all the interactions between a set of hierarchical systems, the Cartesian approach, the substantive perspective of reason, allows operability and the description of these abstract models into logical representations of an observed reality.

The need to build a model that satisfies these essential philosophical requirements leads us to finally enter the text of the original quadripolar proposal with a very brief reminder of the professor's Preface at the University of Louvain, Jean Ladrière, who considered the book "work of reflection, clarification of a path, prospective effort, contribution to the self-constitution of reasoning science, but, truly, thought. Behind the discourse on method is announced, the word of the foundation" (DE BRUYNE; HERMAN & SCHOUTEETE 1974:19). And highlights a material aspect that cannot be overlooked: the epistemological conception underlying methodological approach of the three authors is not an analytical-normative doctrine that could be presented as a kind of canon of scientific reason. Rather, it is an outlet for methodological awareness that, being animated by an effective care of radicalism, tends to always be unfinished, to be suspended for an indefinite requirement of self-awareness or always remain unsatisfied.

De Bruyne and colleagues attacked the delicate and central issue of discussing of scientificity of Social and Humanities Sciences, disrupting the complex that practitioners of these disciplines have come to suffer in the face of "objective and overwhelming" power of natural sciences, capable of imposing criteria and methodological formalism. The alternative does not lie, according to them, in print, but in searching of autonomy of scientific research, effective and proper, together with the constructive principle of interdisciplinarity. Following this path they came to the idea that "a autonomia da prática científica, autonomia cuja precaridade é aparente, pode ser concebida do ponto de vista metodológico como a articulação de diferentes instâncias, de diferentes pólos determinando um espaço em que a pesquisa se apresente como implicada num campo de forças, submetida a certos fluxos, a certas exigências internas" (DE BRUYNE; HERMAN & SCHOUTHEETE 1974: 34).

So, they distinguished four methodological poles in scientific practice: epistemological, theoretical, morphological and technical.

According to the authors, the first and decisive pole across dynamic research is epistemological that "plays a critical role in surveillance" (DE BRUYNE; Herman & SCHOUTHEETE 1974: 34). Throughout the research, it ensures the objectivity – in other words, the production – the scientific object, the explanation of the research problem. It takes charge continually renewing the rupture of scientific objects with common sense. In a final instance, it decides the rules of production and explanation of the facts, of the understanding and of the validity of the theories (DE BRUYNE; HERMAN & SCHOUTHEETE 1974: 34). It has in its orbit "a range of discursive

processes" too general "methods" that impregnate with its logic the investigator's initiatives. They are, namely, the dialectic, the phenomenology, the hypothetical-deductive logic, quantification – processes that do not mutually exclude themselves, some may even be ubiquitous, and others may not appear in specific searches.

The theoretical pole guides the development of hypotheses and the construction of concepts. It is the place of systematic formulation of scientific objects. Proposes rules to interpret the facts of specification and definition of the solutions to the provisionally given to the problems. Finally the place of the development of scientific languages and determining the conceptualization movement (DE BRUYNE; HERMAN & SCHOUTHEETE 1974: 35) and that is a neighbor of "frames of reference" that provide inspirations and issues arising from theoretical and practical contributions of disciplines and "habits" acquired. These "frames of reference" play an implicit paradigmatic role. Here are a few: the "positivist", the "understanding", the "functionalist" and the "structuralist".

The morphological pole is the instance of the statement of the rules for structuring, formation of scientific object by imposing some shape or form, a certain order among its elements. It allows to put a space of causal network to be built in the scientific objects, either as models/copies, or as simulations of real problems (DE BRUYNE; HERMAN & SCHOUTHEETE 1974: 35). It also raises several modalities of frame of analysis, various methods of activation of the constitutive elements of scientific objects: the typology, the ideal type, the system, the structural models. These various configuration forms compromise, in most cases, research on the choices mutually exclusive. The causality is designed in a particular way in each of these frames of analysis.

The technical center controls the collection of data, it strives to finds them to put them in confrontation with the theory that was raised. It requires precision in observation, but does not guarantee, by itself, accuracy (De Bruyne; Herman & SCHOUTHEETE 1974: 35-36). These modes of investigation indicate practical choices by which researchers choose a particular type against the empirical facts.

The dialectical interaction of different poles constitutes the essence of the method proposed that concretely inspire the modeling that we operate here, taking in account an open and systemic implementation of Distance Education. Method/theory and model are distinct concepts and they are here to remind you briefly (SILVA, 2010).

Under the entry model DeltCI – Electronic Dictionary of Terminology in Science Information, the strategy was limited to match the target that it was intended to achieve immediately: putting the operative concept model in the theoretical-methodological arsenal of Information Science, and lacking emerging field of theoretical and conceptual appropriations, properly adjusted to your specific issues and problems, and even theoretical and conceptual formulations themselves. For this, it should be from the surrounding environment of Social Sciences and establish links and the most appropriate specification. However, the approach is too short and narrow, even though that model and modeling constitute a strike rich length accompanying scientific development since the mid-century XIX, deserving discussions and in-depth epistemological reflections.

And what about this scenario? The scarcity dominates, albeit a small book by the French philosopher Alain Badiou titled Le concept de modèle introduction à une épistémologie matérialiste des mathématiques (Badiou, 1969), which placed the subject in field discussions of the structuralist project in the Social Sciences and Humanities and had the concept model called attention to a crucial philosophical issue: relationship established by modern science between epistemology and ontology and multiplies itself in various questions such as "what is a model?" , "what does it mean to model one problem?" , "these expressions have the same sense in logic and in physics?" , "the same sense in biology and in engineering?" , "the same sense in climatology and in economy?" , "the same sense the environment science and in political science?" . In the answer to these and other questions it is untied and explained the intricacies of the essential question set out above.

Here, it is important to emphasize the distinction between theory, model and method, since in Social Sciences conceiving and operationalizing a model does not dispense a clear theoretical basis and does not end in practicality merely instrumental.

The theory emerges as an instrument of general explanation of the phenomena which aims to answer, once properly formulated, the multiple issues concerning "several concrete systems", while model is often confined to the precise and well delimited objectives. But, as the author emphasizes, in a large part of the modern literature, the semantic difference is up-blurred and even tends to disappear, there is rather a confusion which contributed greatly to empiricism, after the Renaissance, and skepticism "which should inevitably result from the findings of a large part of the philosophy of science and epistemology as the difficulty of achieving indisputable certainties when it comes to scientific knowledge and its conformity to a final

and unequivocal reality" (DELATTRE, 1992: 270). Relativism eventually provids extensive use of the term "model" understood, then, as "a kind of understatement of the concept of theory" (DELATTRE, 1992: 270).

That said, in general terms, it should be noted that the quadripolar methodology served not only of inspiration but as a reference to the legitimate and necessary initiative to find a theoretical and practical tool – a model – to help implement and continuously review the Distance Education training system.

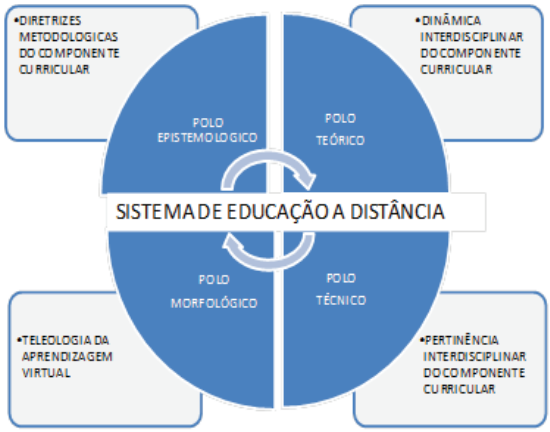
A quadripolar model to distance education

It is undoubtedly important to highlight the role of new technologies for democratizing Distance Education, it expands the universe of knowledge and inserts the student as subject of their learning process, with the advantage that he can also discover how to become an active subject of researching and sharing the content.

However, it is worth noting that the e-learning systems are the technological important tools for the development of the teaching-learning process in the distance education system – they are means, not ends, per se; since the distance education is in a process that transcends beyond the distance learning. While distance learning focuses on the process of learning, socialization of information and instruction, education is based on the process of human development, the knowledge of thinking, creating, innovating and the knowledge of construction (MAFRA, 1998). In this sense, e-learning system consists in one part of the whole we call education mediated by information and communication technology, hence the need to see Distance Education from the perspective of systems theory.

Thus, when dealing with the distance education mediated by information and communication technology, may be taken as a reference, to a particular educational reality observed, the construct of the Distance Education System under the focus of the quadripolar model.

Figure 2 – System of Distance Education under the Focus Quadripolar Method



Source: Authors

The Epistemological Pole presupposes the development of a diagnostic action based on questionnaires and questioning attitude toward the thematic issues to be addressed and the educational prerequisites necessary for the definition of the knowledge object to be exploited in the organization and construction of a unit of curricular knowledge. On the other hand, it focuses on elements that lead to the identification of methods and practices related to the teaching-learning process to meet precepts of the education program, in reference to the set of skills and competencies to be transmitted to the student.

The Theoretical Pole, in reference to methodological guidelines of the curricular component establishes a set of theoretical and practical approaches to the reasoning of unit of the curricular knowledge, establishing a trans and interdisciplinary systematic to thematic content of the curriculum components.

The Technical pole is the benchmark analysis of the relevance and consistency of the unit curricular knowledge, regarding the application of trans and interdisciplinary to thematic content of the curricular component of interactivity and use of multimedia resources.

The Morphological Pole is based on the teleology of learning in a virtual environment via web. The purpose of the virtual learning environment is to establish conditions conducive for the development of an area that promotes the dialogue and

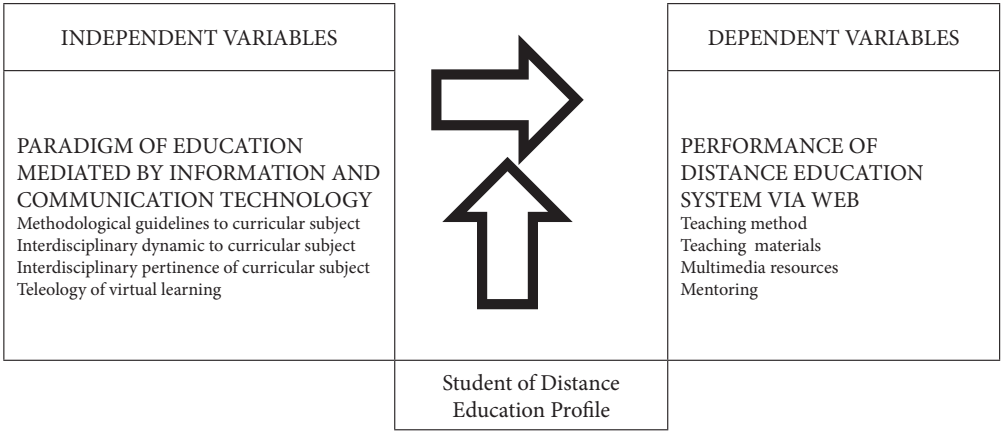
interaction between the tutor and the student, such as the use of multi-media tools, such as to satisfactorily promote the process of teaching and learning.

Therefore, the systemic thinking of distance education through the prism quadripolar method and through a related model, expands the understanding of the education phenomena mediated by information and communication technology by introducing the proposition of unification between intuition and reason, as a synthesis derived from the analytical result of observing reason, expresses the viewpoint of system, and that is the construction of abstract models of observed realities and operant reason, logic, describing analytically the logical structure of the abstract model observed.

The model applied to the investigation

The formal design of the research, for the primary data collection was structured in Distance Education System from the quadripolar model (Figure 2) with the objective of identify, from the point of view of Distance Education students, evidence, i.e. whether there is an association between the paradigms of education mediated by information and communication technology and the performance of the education system via the UEG web.

Figure 3 Paradigms of Distance Education mediated by information and communication technology and the performance of the respective system



Variable of Control

Source: Authors

The results of the empirical research were analyzed by using the statistical inferential. Data were obtained through application of the structured questionnaire to the students participating in the training course for development of teaching materials, with the modality of distance education via the web, in UEG. The analysis was based on the application of

Pearson Correlation technique to determine the degree of association between variables studied. It was also applied to the Pearson Correlation and Cronbach alpha for the validation of the applied research instrument, as well as got the measuring of the degree of reliability of the internal data collected.

From the universe of students surveyed it gave a return of 84 (eighty-four) questionnaires. 4 (four) questionnaires were discarded because of errors and omissions in completing the data collection instrument. Therefore, the sample consists of 72, 73% of respondents referenced in the course, allowing us to infer the representativeness of the sample. The non-respondent group is homogeneous to the respondent group, considering the criteria for defining the sample, i.e., students participating in the course Elaboration and Production of Educational and Pedagogical Material.

The validation test of the questionnaire measured through Cronbach Alpha obtained a grade rating of good consistency. This result confirms the validation and reliability of the instrument for data collection.

Analysis of the correlation between variables

It can be confirmed the existence of the degree of positive association between the variables of the construct, paradigms of education mediated by information and communication technology and the performance of the distance education system via web, from the conceptual model called distance education system from the standpoint of the quadripolar model. To infer the degree of association between the explanatory variables, paradigms of mediated education for information and communication (VI) technology and performance variables explained the distance education system via the Web (VD), It was made the multiple correlation between the designated independent variables and methodological guidelines for curricular subject (VI.1); dynamics of interdisciplinary curricular subject (VI.2); interdisciplinary relevance of curricular subject (VI.3); teleology of virtual learning

(VI.4) and the dependent variables named teaching method (RV. 1), educational courseware (VD. 2), multimedia resources (VD. 3) and mentoring (VD. 4).

This analysis got the following results:

a) the correlations are all significant at $p \leq 0, 05$, albeit with different intensities between them. Therefore, it is inferred that there positive association between the independent variables: methodological guidelines for curricular subject (VI. 1), dynamic interdisciplinary the curricular subject (VI.2), interdisciplinary relevance of the curricular subject (VI.3); teleology of virtual learning (VI.4) and the dependent variables of teaching method (VD. 1), educational courseware (VD. 2), multimedia resources (VD. 3) and mentoring (VD. 4).

b) The positive association of the explanatory variable, methodological guidelines for curricular subject and for other variables explained signals the conceptual map of the course and the assignment of multimedia resources have direct influence on the variables performance of the education system via the web. Thus, one can infer the degree of relevance of the epistemological pole to the system of distance education via the web;

c) The explanatory variable of dynamic interdisciplinary of curricular subject has a positive association with the other variables explained. Therefore, there is evidence that the theoretical foundation and build practice, from methodological guidelines from curricular subject, it has direct influence on variables of the performance of distance education system via web. Therefore, it can be inferred how relevant the theoretical pole to the distance education system;

d) The appropriateness of the interdisciplinary curricular subject, explanatory variable, is associated with other variables explained positively. This way, analysis of interdisciplinary consistency of teaching material and the interdisciplinary teaching and interactivity multimedia have direct influence on the performance variables of the distance education system via the web. This is why the degree of relevance of technical pole for the system of distance education can be inferred;

e) There is a positive association between the explanatory variable virtual learning environment and other variables explained. Therefore, the virtual learning environment has a direct influence on the variables performance of the distance education system via the web. Thus, the degree of relevance of morphological pole to the distance education system can be inferred, table 1.

Table 1 – Matrix correlation of multiple independent variables in paradigms of education mediated by information technology and dependents variables performance of the distance education system via web at significance level of 5%

Dependent Variable / Dependent Variable		Performance of Distance Education System via Web							
		V.D. 1 TEACHING METHOD		V.D.2 TEACHING MATERIALS		V.D.3 MULTIMEDIA RESOURCE		V.D.4 MENTORING	
		Correlation	Significance level	Correlation	Significance level	Correlation	Significance level	Correlation	Significance level
Paradigms of education mediated by information and communication technology	VI.1 – Methodological guidelines To curricular subject	Moderate Positive	0,023837	Low Positive	0,023837	Weak Positive	0,023837	Moderate Positive	0,023837
	VI 2 - Interdisciplinary dynamic to curricular subject	Moderate Positive	0,014512	Low Positive	0,014512	Weak Positive	0,014512	Moderate Positive	0,014512
	VI.3 Interdisciplinary pertinence of curricular subject	Weak Positive	0,026781	Low Positive	0,026781	Weak Positive	0,026781	Moderate Positive	0,026781
	VI.4 Teleology of virtual learning	Moderate Positive	0,017317	Low Positive	0,017317	Weak Positive	0,017317	Weak Positive	0,017317

Source: Authors

Conclusion

The quadripolar model applied to the distance education system is a feasible proposal that portrays the perspective of integration of education mediated by information and communication technology and the theories and practices of education. The data from this research corroborates with this assertion, because the construct distance education system under the focus of quadripolar model shows itself consistent when subjected to statistical tests to determine the degree of association between explanatory variables and explained the construct analyzed. The following are the highlights of this research:

a) It confirms the validity of the construct of distance education system from the standpoint of the quadripolar model, by applying the paradigms of education mediated by information and communication technology: methodological guidelines for curricular subject (epistemological pole), for dynamic interdisciplinary curricular subject (theoretical pole), interdisciplinary relevance of curricular subject (technical center) and teleology of virtual learning (morphological pole);

b) The paradigms of education, mediated by information and communication technology, have positive influence on performance distance education system via the web on the issues focused on teaching method in the teaching learning materials, resources for multimedia and mentoring;.

c) In the perception of the students there is evidence that the organization and structuring of a course under the focus of the quadripolar model has positive effect on the teaching and learning process in courses in distance mode via web.

Finally, the results of this research indicate with evidence that the distance education system from the standpoint of the quadripolar model is feasible, with the methodological parameter applied by UEG – Brazil, in the form of courses in distance mode via the web. However, the results obtained in this investigation should not be universalized without prior promote widespread application in other systems education in distance mode. Therefore, it is recommended that the reapplication of this research in other education institutions to serve as a comparative basis for new studies.

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