

A MULTI-METHOD INNOVATION STRATEGY FOR UNIVERSITIES: DISCUSSING DISTANCE EDUCATION IN LIGHT OF LEARNING STYLES, MULTIPLE INTELLIGENCES AND REQUIRED COMPETENCIES

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The balance between learning styles, multiple intelligences and required professional competencies is a way of promoting a higher chance of adaptation to everyday situations or work demands. This is the goal of this work, which proposes a multi-method support system based on critical factors of success (CFS), required professional competencies (RPC), learning styles (LS) and multiple intelligences (MI). This method can guide the implementation of innovation strategies when planning DE projects. It also presents a multiple-case study of DE Business Programs in private and public higher education institutions in Brazil. This methodological support comprises four phases. In Phase 1 CFS of a DE project are determined based on specialized literature, environmental analysis and experts' points of view. In Phase 2 the students' LS are assessed by means of Felder and Solomon's model. In Phase 3 the students' RPC are established via the Delphi technique. In Phase 4 the MI are ascertained through Gardner's model (1994). Finally, RPC are prioritized, in order of importance, vis-à-vis CFS; so are LS and MI regarding RPC. In order to reduce the subjectivity of results, the study adopts the multi-criteria methods Compromise Programming, Electre III and Promethee II and the psychometric scaling method Law of Categorical Judgments and multivariate cluster analysis. The results obtained have been satisfying, validating the proceeding proposed.

Palavras-chaves: Multi-Method - Innovation Strategy Universities - Distance Education - Learning Styles - Multiple Intelligences - Required Competencies

1. Introduction

There is a huge demand for information and knowledge in today's world. Instruction is a systematic and continuous assessment process of future needs for human resources. This process must result in individuals with adequate skills, experiences and competencies to carry out the right tasks at the right time and place. In this direction, efficient management of Distance Education (DE) should be based on methods and techniques that allow for correct planning and decision making.

Distance Education (DE) in Brazil is still a novel theme of scientific investigation. There are many publications on this matter, but few of them can be used to systematically compose Brazil's experience in this sector. Our DE methods and techniques lag far behind those advanced by international experiences; Brazil lacks material, technological and human resources. Knowledge is insufficient and intellectual capital is unqualified, which makes it difficult to accomplish projects of such importance. There lies the relevance of the methodological contribution of this work as it highlights critical priorities deemed as necessary to implement projects of this nature, thus contributing to the construction of intellectual capital as a strategic element in DE Business programs.

Developing DE projects involves a multiplicity of highly complex events in risky and uncertain contexts, which may affect the project flow and thwart expectations of stability. One must bear in mind the risks deriving from diverse sources and scenarios caused by environmental factors or by factors inherent to the projects themselves. It is necessary to understand that implementing DE projects is never easy and that one of the main focal points is effective organization of resources to instruct personnel so as to target competencies required to reach a given work performance level. Characteristics of projects vary; their analyses should be differentiated as well. In addition, pertinent literature diverges as regards the conception of DE. Good practice recommends the fulfillment of a series of articulated actions, consisting of the following phases. Phase I comprises two steps: Step 1 – (i) planning for needs; (ii) institutionalization and configuration of project teams and determination of communication procedures (market testing, inclusive); (iii) consolidation of project objectives, results and performance goals; (iv) drafting of reference projects; (v) investigation of costs, budgets, cash flows; (vi) study of social impacts; (vii) analysis, allocation and management of risks (preliminary evaluation); and (viii) analysis of basic viability. Step 2 – (i) project refinement; and (ii) refinement of analysis of costs, impacts and risks. Phase II encompasses the development and implementation, evolution and continuation.

Students' learning processes in DE projects are more complex due to: (i) expectations and intentions: DE students spouse different motives for enrollment, ranging from the need to have a diploma to the desire to update their knowledge; (ii) learning styles and paces: they may be cooperative, competitive or individualized – the fact that each person has a preferred mode of learning, i.e., his/her own learning style, is critical in DE; (iii) teaching and study-time

management strategies: one of the greatest difficulties is establishing contents and sequences that can motivate students and lead them to self-direct learning; (iv) support to students: since every individual presents a different learning pace, defining and delimiting the support to students is a vital characteristic to achieve success in this instructional mode; (v) learning assessment. This reaffirms the relevance of finding out students' learning styles in view of adequately planning projects of this nature. In spite of this, the planning phase is traditionally elaborated disregarding the other end: the users of the system. It is fundamental that the users' learning styles be considered. Each individual has his/her own mode of processing information, perceiving, thinking and solving problems. Students' idiosyncrasies, preferences and previous knowledge are often neglected. People learn in different ways (Felder and Soloman, 1996). Some show more competence when dealing with theories and mathematical models, others are more inclined to attend to concrete facts and data. Some respond better to visual information, e.g., figures and diagrams, whereas others prefer oral and written information. Acknowledging these different learning styles may contribute to better resource allocation and DE results. This is essential for teachers when defining the most adequate teaching-learning strategy. On the other hand, students' knowledge of their learning styles may promote changes on the individual level (e.g., development of motivation, attitudes and behaviors) and on the professional level (e.g., improvement of professional competencies). Competency in a given activity often depends on how a given individual combines his/her different learning styles. In addition, it is vital to assess and acknowledge the individual's or group of individuals' multiple intelligences. The Multiple Intelligences Theory has the potential to expand curriculum guidelines to include all educational and personal needs in a holistic way and to promote behaviors and attitudes as well as the technical skills forwarded by graduation programs (GARDNER, 1994).

Finding the balance between learning styles, multiple intelligences and required professional competencies is a way of promoting a higher chance of adaptation to everyday situations or work demands. Yet, how can this diversity be dealt with in the DE context? This is the goal of this work, which proposes a multi-method support system based on critical factors of success (CFS), required professional competencies (RPC), learning styles (LS) and multiple intelligences (MI). This method can guide the implementation of innovation strategies when planning DE projects. It also presents a multiple-case study of DE Business Programs in private and public higher education institutions in Brazil. This methodological support comprises four phases. In Phase 1 CFS of a DE project are determined based on specialized literature, environmental analysis and experts' points of view. In Phase 2 the students' LS are assessed by means of Felder and Solomon's model. In Phase 3 the students' RPC are established via the Delphi technique. In Phase 4 the MI are ascertained through Gardner's model (1994). Finally, RPC are prioritized, in order of importance, vis-à-vis CFS; so are LS and MI regarding RPC. In order to reduce the subjectivity of results, the study adopts the multi-criteria methods Compromise Programming, Electre III and Promethee II and the psychometric scaling method Law of Categorical Judgments. These different stages are detailed here.

2 The Research : Steps And Application

The purpose of this section is to present a Multi-method proposal aimed at giving the managers of DE projects information, enabling them to: (a) monitor the political, economic and social environment, the regulation aspects, risks that directly and indirectly impact the project, (b) better assembly and management of the project, (c) definition of costs structure (d) definition regarding the investments in DE projects, and (e) definition of results to be achieved. It is emphasized that this study was applied through a semi-structured questionnaire, in four Institutions of Public and Private Higher Education, with 73 graduate students in production engineering. Therefore, in order to better reach the performance of a DE project, the Multi-method proposal obeys the following procedure: it initiates from the methodology of CFS in DE (phase 1). Then (Stage 2) the CPRs (Administrators) are determined. Later the DE of students (phase 3) are determined. Finally (phase 4), the IM of the students are set up, and it is concluded by prioritizing by importance, the CPR in relation to the FCS, then the EA and IM regarding the CPR. The Multi-method steps are described as follows:

Phase 1 - Identification of Critical Success Factors of (CSF) in DE

This stage aims to identify the FCS projects in DE. The CFS "are those few areas, for any business, where the results, if satisfactory, will ensure a competitive and successful performance for the organization" (ROCKART, 1979). The FCS have been applied to organizations for various reasons (Stollenwerk, 2001), for example, to refine mental maps and support in shaping the skills, technologies and knowledge deemed essential by the organizations for superior performance in particular activity branches. The identification of CFS takes place from a wide selection of findings in the national and international DE literature, especially (but not exclusively) those involving the Administration industry. Once the FCS are identified the scaling model of categorical judgment, formulated by Thurstone in 1927 (Souza, 1988) are suggested as a support tool to evaluate the scaling model. The application of this method aims to explain the structure of preferences of specialists in respect of all the stimuli, in this case, the CFS. The expressions of preferences occur in various moments, and thus, the values of scale vary as a result of their mental process dynamics. The result of the preferences is then presented in increasing order of importance.

During this research several CFS of DE were filtered. After the identifying the CFS and for better understanding, they were regrouped by clusters, within the tree structure principle, which allows the extension of the CFS in different processes or areas involved, but always observing the relationship of relevance.

Data treatment: Multivariate Analysis Grouping was adopted by Cluster for the data treatment. The cluster analysis is a tool that groups data homogeneously from coefficients of similarity or correspondence. The coefficient of similarity indicates the strength of the

relationship between the factors or variables, setting a common value to them (EVERITT, 1993). The grouping analysis aims to bring together, by some classification criterion, the sampling units in groups, so that there is uniformity within the group and heterogeneity between groups (CRUZ and REGAZZI, 1994; JOHNSON and WICHERN, 1992). For the delimitation of the groups, Tocher's technique of optimizing was used, quoted by Rao (1952). This methodology uses the criterion that the mean dissimilarity of measures within each group should be less than the distance between any medium groups (CRUZ, 1997). From the matrix of dissimilarity, the pair of similar topics was identified, which formed the initial group. From there, the possibility for the inclusion of new topics was evaluated (CRUZ and REGAZZI, 1994). The following groups of factors were adopted: a) Political/Legal b) Technical c) Economic and Financial d) Mercadology. These CFS are detailed as follows.

Technical Factor – It is with this factor, that the behavior related to the technical issues will be known, such as the support tools for the construction of projects for DE. The development of those projects involves complex procedures and requires technical know-how of various technological, contractual (legal), financial and political processes. Relevant issues are described here as assessment of user needs of DE; project assembly, project design, contracts, evaluation of projects, the operation of processes, coordination and management of projects, among others.

Mercadology and Business Factor – This includes, the issues concerning the DE market such as: users, level of service, supply, demand, the macroeconomic aspects that influence business (project), the actors involved, such as, governmental decisions, investment guidelines, the risk policies, among others. When performing such an analysis individually and jointly, it is possible to know what is occurring with this factor and how this affects the performance of the project. Given the evidence to make viable the DE projects, such variables should be considered within the context permeating the decisions of DE.

Economic and Financial Factor - By defining this factor, it is possible to see the issues relating to the behavior/trends regarding the economic and financial issues, such as: government economic guidelines, economic and financial indicators, financial markets, risk policies, cost structure, among others. By having this information, some points are known to enable the suitability of the project, such as assurance of the best possible economic performance of the project, a permanent maintenance of a financial balance and a balanced debt policy debt.

Legal Factor - With the definition of the legal "cluster" and its components, the legal and institutional aspects most relevant are known; the laws, rules, changes in legislation, etc. More specifically, to have information concerning issues that affect the performance of the projects, such as legal and institutional issues, contractual guarantees, rights/duties of consumers, the protection of competition, and the fulfillment of social responsibility. Such information regarding this factor ensures the legal and institutional adequacy of the projects.

Political Factor - in general terms, this block seeks to "cover" the following critical issues: institutional changes in the guidelines of education, investment, and the guidelines and goals with

respect to the governmental strategic planning for the country. Specifically, it is vital to have information regarding mechanisms for investments; the containment of political crises etc. When analyzing information both individually and jointly, it is possible to know what is taking place with this factor and how this affects the performance of the project. Once the CFS are identified, the very CPR is identified - Administration (phase 2).

Once the CFS are identified, the scaling model of categorical judgments by Thurstone, 1927 (Souza, 1988), was used as a support tool for the evaluation.

The application of these methods has objective to explain the structure of specialists' preferences in relation to a whole of stimulations, while it searches to reduce the uncertainty degree produced by the subjectivity in the decisions concerning DE. The method of the Categorical Judgments is a modeling of mental behavior that has objective to explain the structure of the preferences of the specialists in relation to a whole of stimulations. This procedure has broken of a set consisting of m classrooms, exhausting and mutually exclusive, where they must necessarily be ranks the n O_1 stimulations, O_2 , O_n . In the scale of stimulations adopted, C_1 contains the pertaining stimulations less intense than a C_2 about characteristic C ; C_2 contains pertaining less intense stimulations of the one than the a C_3 to same characteristic C and Successively (THRUSTONE, 1.927)). As it discourses the model, evaluating each stimulation for its value of scale, with this mental process called processing of "modal discrimination", and they show the preferences by means of the comparisons affected with the values of its perceivable manifestations and that they are represented by the choices through the relative preferences' frequencies. An excellent question is the nature psychophysics of the method. The manifestations of preferences occur in diverse instants, and this way, the values of the scale will vary in function of the proper dynamics of its mental process (THURSTONE, 1927). Thus, in view of the scale's process of the stimulations, the notion of preference for the probability of the preference must be substituted. In this work, the option for the scale's method CJT of Thurstone can be justified for being a strategically tool to be tested to prioritize cognitive elements in DE, in situations that if consider the mental behavior to explain the preferences' structure of the decision, in relation of elements' priorities. It is distinguished relevance that this method presents when it involves questions of high degree of subjectivity and complexity, as it is the case of DE. The evaluation of objects of knowledge (LJC) happened in three stages:

In the stage (1), one determined the frequencies for pairs of stimulations, where O_i is equivalent to objects of knowledge and O_j the specialists. The data had been extracted from the preferences of the specialists in relation to CFC, attributing weights to the cognitive elements.

After that (stage 2), it is determined the preferences of the specialists in relation of stimulations. The results had been gotten by means of the ordinal frequencies from the results of the previous stage.

Finally (stage 3), the accumulated relative frequencies were calculated first. The results gotten here reflect the probabilities of preferences' intensity of the specialists in relation to the

stimulations. The result of the preferences, then, is presented orderly importance increasing.): first, the Market and Political Factors; second, the Technical Factor; third, the Economical and Financial Factor; and fourth, the Legal Factor.

Table 1: CSF of projects – Method of Categorical Judgment of Thurstone (1927)

Stimulaton (CSF)	$\mu_i = -\sum_{j=1}^4 Z_{ij} / 4$	Classification
Market	-3,34	1°
Political	-3,35	1°
Judicial	4,92	4°
Technical	-1,19	2°
Economical and Financial	1,36	3°

Phase 2: Determination of the professional skills required

This step aims to determine the CPR of the Administrator. For this the Delphi methodology was used, proposed by Santos (2001), which consists of four steps: (i) the creation of expert groups, (ii) development of the first round, (iii) development of the second round, (iv) development of the third round, and (v) development of the fourth round. The main application of the Delphi method is the search for opinion consensus of the group of experts, the basic premise is that the collective judgment, when organized properly, is better than the individual opinion. Another advantage is the possibility of an interdisciplinary approach (MÂSIH, 2005).

Among them are some skills and abilities that the Administrator should develop throughout training, among them (FLEURY e FLEURY, 2000): (i) business competencies – entrepreneurship, consultancy skills in management and business; (ii) social competencies – social responsibility, holistic view, humanistic education, multidisciplinary team work skills, and lifelong professional learning skills; and (iii) technical competencies – technical and scientific knowledge required to be able to manage organizations, critically reflect and act upon production, oral and written communication skills, ability to understand and interpret graphic texts (FLEURY AND FLEURY, 2000). It has been stated that competencies, within a given field of practice, oftentimes depend on effective management of different LS (FELDER, 1995).

Phase 3: Identification of Students' Learning Styles

This stage aims to identify the DE of students (course participants). Through a brief portrait of history it is seen that elements of learning styles appeared early, around 1892, according to the referenced literature. The term "styles of learning" was probably first used by Thelen (1954) in group dynamics at work. The styles of learning emerged as a pillar of support in the 1970s in an effort to "heat" the teaching methods and explain the various factors such as how students learn. (DUNN and DUNN, 1979; KEEFE, 1979; KOLB, 1976).

The study of the learning styles is part of a more complex research field and must be understood as an interaction; learning is a social process that is influenced by both individual characteristics and meaning of the psychological situation of learning. (KWAKMAN, 1999; WIERSTRA, 2000; WIERSTRA and BEERENDS, 1996).

More specifically, it is believed that the learning styles should be represented in a model of interaction, where cause and effect or situation is viewed in a relationship of reciprocal action in which each one affects changes of the other (KWAKMAN, 1999; OVERTON and REESE, 1973).

Pervin (1968) calls for this, because there are continuous mutual influence between different individuals and situational factors. Styles of learning are characterized as cognitive, affective and psychological behavior that indicates how students perceive, interact and respond to the learning environment (NASSP, 1979). The Learning Styles can also be defined as the tendency to adopt a particular strategy to learn. Some students have a particular strategy to learn, and prefer to adapt this versatile style to the tasks they develop (PASK, et al, 1977).

The literature is convergent about differentiating the students in terms of learning. The styles are important in the learning process (Dunn, Griggs, 2000; Thelen, 1954, Kolb, 1976, 1985; Myers, 1962; Jung, 1981; Felder, 1996; Felder and Silverman, 1988; Klein, 2003; Myers and McCauley , 1986; Sadler-Smith et al, 1978; Gagne, 1985; Honey, 1985.1992; Schmeck, 1988) and is thus of considerable importance such responsibility for the education or development of human resources. However it is not rare to see that the individualities, the preferences and previous knowledge of the students are almost always ignored. Yet, how to attend this diversity within the scope of distance education? One way to study individual differences and their influence on learning is through the learning styles, constructs that support the study of different forms of mental representations. As categories, they should serve to access, more systematized, the ways in which knowledge is perceived, and therefore such instruments should serve as a support for the elaboration of methodologies and teaching activities to be used in instructional programs.

Within this spectrum, the inventory of Felder and Saloman (1996), derived from the model developed by Felder and Silverman (1988) was used in this document, which is directed to the characteristics of learning. This instrument for data collection, called Index of DE (Index of learning styles - ILS), classifies students in four of dimensions: (i) (Sensorial/Intuitive): refers to the way information is perceived, (ii) (Visual/Verbal): indicates information retention (iii) (Active/Reflexive): shows the way to process information, (iv) (Sequential/Global): presents the way for organizing information. The results indicate the dominant extent among the five pairs, which are expressed in the scale: mild, moderate and strong. The ILS is a self-administered instrument that identifies the learning preferences from the answerer. It is composed of 44 forced choice questions, 11 for each of the four dimensions of learning covered by the instrument. The results are presented in terms of each of the dimensions. The inventory was applied (as

mentioned above) to Graduate students of both sexes in the Administration course, (Distance) of four Public and Private Higher Education institutions. The DE of 73 students was mapped. The results obtained in the research are detailed in Figure 1 below.

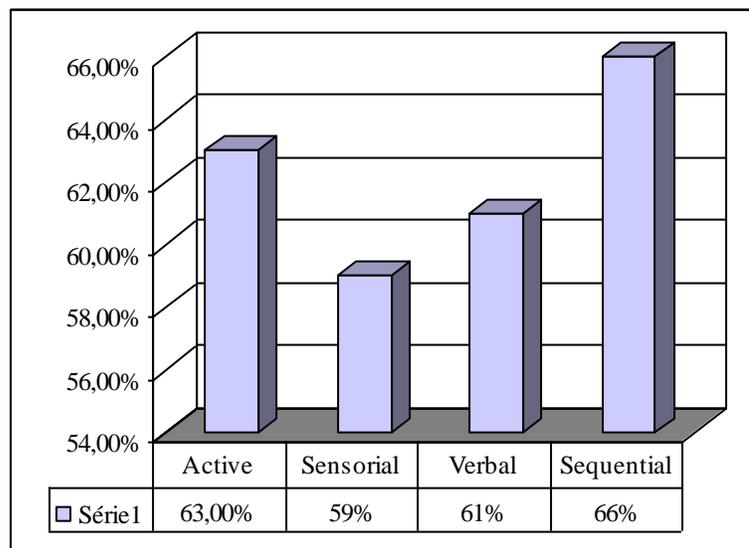


Figure 1 – General Learning Styles of Students

Figure 1 shows the predominant profile of the students, based on the model of Felder e Soloman (1996) Active (63%), Sensorial (59%), Verbal (61%), and Sequential (66%). The predominance of the Active/Sequential style indicates that the student prefers to perform, practice, solving real problem situations. Participates effectively in discussions, mainly those involving practical aspects of a specific problem, hence their greater propensity in presenting a good performance in team work and like to learn continuously, step by step. Once the DE is raised, the next stage (4) is to determine the IM of the students.

Phase 4: Determination of Multiple Intelligences

This phase includes the Multiple Intelligences of the students from DE in graduate courses in Business Administration in the institutions surveyed. The Theory of IM has the proposal of development of an individual, considering specific skills and stimulating the ability to assimilate content in naturally, as well as the ability to solve personal and professional conflict in a balanced manner and the ability for team work, among others. This theory is yet another tool in the hands of those who teach, in order to facilitate the implementation of teaching practices and their

planning, taking as reference, in addition to the content and strategies, the reaching of goals proposed by the discipline. The types of multiple intelligences considered here are based on Gardner’s proposal (1994): linguistic, musical, logical-mathematical, spatial, kinesthetic-corporal, intrapersonal and interpersonal. By combining the multifarious dimensions of intelligence, the results (Figure 2) of this work show that there are no predominant types of intelligence, with more emphasis on the personal intelligence category (17.2% and 16.3%) and less emphasis on the kinesthetic-corporal intelligence category (8.6%).

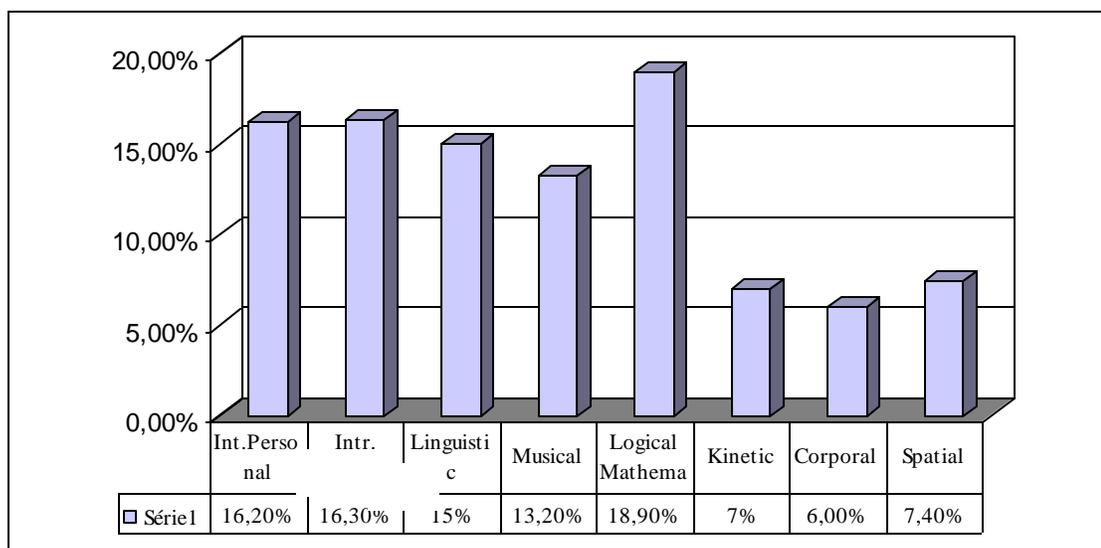


Figure 02: Multiple Intelligences – Students - DE - Undergraduate Administration

Gathering the various dimensions of Intelligences, the results show (Figure 02) that there are no major predominance of one or another kind of intelligence, with emphasis on the Personal Intelligences (17.2% and 16.3%), and exception for category Kinetic-Corporal (8.6%). Aligned to this, an area is opened towards the definition of new planning strategies to be adopted for education. It should be kept in mind that such strategies should be targeted in order to reach students who have the following profiles: They like to read and write, explain, teach, learn, recognize abstract patterns, inductive and deductive reasoning, understanding of relationships and connections, preferences for experiments, solutions of complex calculations, active imagination, recognition of relationships between objects and spaces, graphical representation and manipulation of images, capacity for abstraction and reasoning, sense of self, full concentration of the mind, cooperative work, understanding the perspective of the other, verbal and non-verbal communication, capacity for leadership and motivation, perception and distinguishing the emotional state of others, etc.

In the view of experts, regarding CPR and CFS, the results show a greater importance of business skills to ensure the Political and Mercadological CFS. And indicate the technical competencies to ensure the Econ/Fin and Technical CFS. It means that there is a greater need for managers of DE to concentrate greater efforts in these competencies aiming to ensure such CFS.

With regards to the results of the priorities of DE regarding CPR, from the view of experts, to ensure the Business skills it is vital that the individual considers Learning Styles that are predominantly Active/Global/Verbal/Intuitive. About these individuals, it can be said that they have the capacity to absorb the information in large holistic leaps. Fragments apparently without connection suddenly connect to form the greater picture, and everything is clear. They need to see the context in which the situation occurs to then understand how to join the parts to resolve the problem. They have the ability to "join knowledge" in innovative ways to solve problems in creatively, but may have some difficulty in explaining his reasoning; because his focus is on the synthesis, no systemic thinking, and not on the linearity. The global may have trouble working in activities where it is hard to see the intended final objective. Similarly, a sequential, linear, well organized training, yet out of context can be seen as inefficient. Furthermore, they are individuals who tend to better understand and retain the information by participating actively carrying out an activity. Regarding the Active style, in general, these individuals prefer to perform, practice, solving real problems situations. They participate effectively in discussions, mainly involving practical aspects of a specific problem, hence their greater propensity to present good performance in teamwork. Normally, they are quick with responses and movements, but can react prematurely, without having evaluated consequences and impacts

It is recommended, therefore, that for instance, when participating in an activity (class, business meeting, committee) when the discussion of a practical problem or its solution is not emphasized, it is important that this divergence be compensated with their learning style by preparing beforehand, trying to predict decisions and their consequences. Also working and studying with a group in which the members explain different topics to each other. Try to foresee what might be asked, raising different scenarios and establishing action plans.

Secondly, the importance of the Active/Sensorial/Sequential/Visual DE to ensure the Technical Skills are vital. With regards to these DE, as already discussed, they are individuals who tend to better understand and retain information by actively participating and carrying out an activity. The active prefers to perform, practicing and solving real problem situations. They participate effectively in discussions, mainly those involving practical aspects of a specific problem, hence their greater propensity to present good teamwork performance. Normally they are quick with responses and movements, yet may act prematurely, without first having evaluated consequences and impacts.

About the priorities of IM in relation to CPR, the importance of Personal IM to ensure Social, Business and Technical Skills is emphasized. There is also an emphasis on the Linguistics

Intelligence to ensure, Business, Technical and Social Skills. Indeed, the Linguistics Intelligence means the ability to deal well with the language, both in writing as well as verbal expression. This intelligence can be considered as the best means to negotiate businesses, tasks and to communicate events.

As mentioned above, they are characteristics of people who have this type of intelligence: enjoying reading, writing, explaining, teaching and learning, to convince someone of some fact and then remember. The Personal Intelligences - intrapersonal (mainly concerning the knowledge that the individual has of his own feelings) and interpersonal (related to the performance of behaviors, feelings and motivation for others) - are easier to be interpreted when compared (Gardner, 1994). The basic feature of a person who has this type of intelligence is to be well with himself, managing his own mood, feelings, emotions, projects, etc, all this consistently within a social and professional context. Some characteristics of the individuals who have this kind of intelligence are, as mentioned previously: sense of self, capacity for abstraction and reasoning, perception and expression of intimate feelings.

3.Final Words: What Lessons To Learn?

There are substantial demands for information and knowledge. Training is a systematic and continuous process of evaluations for the future needs of human resources. This process should result in people with skills, experience and skills appropriate to perform the right tasks in the right place and time. In this spectrum, the perspective of management efficiency DE should be within the methods and techniques that enable proper planning towards the decisions to be taken.

This document on DE, in the field of administration is concluded, obviously several issues remain to be detailed in other studies of this kind. For these future studies we hope to have contributed toward the methodological discussion, which can still be widely explored. The guidelines that permeate this work contains the publications that include learning styles, multiple intelligences and skills in Distance Education, but not exclusively, since there were few findings that were of importance for the preparation of this work. There is a belief on the importance of understanding DE towards the needs of society. Needs created in their social, economic and political context.

It should be noted that the DE in Brazil is still a scientific task that barely began. Although we can list a number of titles already available on the subject, few works are of importance for the systematic construction of the Brazilian experience in this sector.

With regard to methods and techniques to enable DE, Brazil is still at a disadvantage when compared to international experiences: it is lacking in materials, technology and human resources. There is insufficient knowledge, and intellectual capital is unprepared. This makes such viable and relevant projects unsustainable. It is within this panorama that our methodological contribution wins emphasis; there is support for the critical priorities to be considered in the list of necessary elements to the implementation of a project of this nature,

contributing to the building of intellectual capital, as strategic element for the Administration courses.

Through this method, a more pragmatic and efficient subsidizing of the guidelines for the development of DE projects is sought in the long run, ensuring national competitiveness with regard to this category of projects. Broad and systemic approaches are sought that are able to meet the most diverse dimensions on DE, overcoming the scarce scientific practice that permeates some works.

This proposal aims, first of all, to highlight issues not yet explored in this very complex subject. Of course, it does not intend to be a "forced" methodology, but one which will provide contribution, even through more open and free paths. Moreover, this methodological support does not claim to be complete, but it is about generating elements of knowledge that are strategic for the development of DE projects; making the decision spectrum smarter, providing essential elements for the elaboration of DE projects. Often these projects are rendered unpractical, often failing while still in the planning phase.

In light of the "Learning Styles, Multiple Intelligences and required Skills " it has been possible to develop the proposal for a methodology which has the purpose of contributing guidelines on the allocation for contributions of resources, to build the intellectual capital in the field of production engineering.

The relevance of the FCS is also acknowledged as another important strategy instrument in the hands of the managers of DE as they can contribute in the prioritization of the weak points; avoiding being deficient in what is relevant to the success of the business (Thompson and Strickland, 2000).

The statistical and psychometric methods addressed here also deserve attention. These instruments make the results achieved more noble and worthy of credibility. Initially, the application of multivariate statistical technique (Hierarchical cluster analysis) in the group of FCS should be praised, in order to correlate the factors identified by the groups involved. With the application of multivariate statistical analysis of grouping it was seen that there is a close relationship between the groups found and identified from the literature.

As it is a relevant theme in the current historical context of our country, it is recommended that this study, given the demonstrated feasibility of the method, be continued and updated on an ongoing basis, enabling the monitoring of changes in the context that the projects of DE are inserted in.

Secondly, the Psychometrical Scaling method, considers the intensity in the probability of preferences, since the context of decisions is dynamic and subjective. This means that the topics listed as priority in the contemporary context may not be the same in another era. This allows placing the method in a noble listing, with the same finality as proposed here, to prioritize issues of urgency and emergency for future research and publications.

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