Technologies for education without distance barriers.

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In this essay we will discuss how technology and methods of distance education can be used to create new learning spaces, making possible the permanent articulation of Distance Education and Classroom-based Education in a unique educational system.

Keywords educational technology; distance education; learning spaces

1. Introduction

We live in a very different world from that where our education system was modeled. Built throughout centuries, this system has as one of its premises still today the idea that the teacher and the student must be present at the same place and time where learning should take place. Besides that, society adapts really quickly to the advances offered by Information and Communications Digital Technologies (ICDT). Our social practices, cultural activities, commercial and human relations and, consequently, education are more and more influenced by technologies.

In this context, it is necessary to question the manner how school systems are run. Rubens Alves, a Brazilian philosopher and educator said that “schools are either cages or give you wings”. We believe that digital technologies and the methods conceived to recreate learning spaces online can give wings to schools. However, even when Distance Education is viable in terms of technology and course design, there are concerns regarding the physical presence of students in school spaces.

It is widely known that Distance Education entails specific methodologies, requires a diversity of technologies and works over physical and psychological limitations, especially regarding the students. However, the main differential of Distance Education is not on the methodology, but on the technologies or on what is required from the students. The differential is on the understanding that this way of educating transcends the possibility of minimizing physical distance. The main characteristic of Distance Education does not show in its name. Distance Education is all about the opportunity of having access to Education. In order to better understand such characteristic, it is necessary to consider that DE works over geographical distances but, most importantly, over chronological distances.

In this perspective, Distance Education may create learning opportunities to those who are far away from the desired/necessary course, as well as to those who are right next to a school and do not have the opportunity to opt for the in-class pedagogical project, whether it is because one has schedule or transportation difficulties of because one has young children and can only study during the night and on weekends.

In this sense, it is important to understand the specificities and the fundaments of Distance Education with the aim of adjusting its resources, methods and tools to create new learning spaces. Thus, it will be viable to articulate the in-class with online possibilities in Education. After all, the focus must not be on the distance itself, but on Education.

2. Minimizing distances

Distance Education came before digital technologies and dates back to the beginning of the 19th Century, when Correspondence Study started being offered in England, the US and Sweden [1, 2]. However, the expression “Distance Education” as we know today was only coined in the late 1960’s, when a group of researchers from the University of Tubingen, in Germany, started referring to Correspondence Study with the words Fernstudium and Fernunterricht, respectively Distance Education and Distance Teaching [2].

Otto Peters, in 1973, was part of the research group and established an organizational basis for Distance Teaching, proposing the use of industrial methods such as planning, labor force specialization, mass production of materials, standardizing and quality control [2]. In parallel to the proposals of professor Otto Peters, Charles Wedemeyer, in 1971, published papers on the theme in which he used the expression “Independent Studies”, based on the idea of an independent student being that who is not only studying at a different time and place, but also that who has potential autonomy in the control and direction of his own learning [3].
The studies of Charles Wedemeyer and Otto Peters influenced Michael Moore [4] in the development of the idea of Transnational Distance, which combined the system and organization of Distance Teaching with the conception of Independent Studies. Such development was based on the idea that, in Distance Education, the act of teaching is separated from the act of learning.

Moore [4] named Teaching Behavior the one of the people involved in tasks of instruction such as teachers and tutors. Making use of verbal and non-verbal language, the teacher executes instruction tasks (e.g. preparing lessons, selecting equipment, defining, classifying, explaining); directive tasks (e.g. guiding students on how to develop tasks and correct their own work, showing alternatives) and disciplinary tasks (e.g. praising good results, inhibiting inappropriate attitudes). As for Learning Behaviors, Moore [4] defines as being those of students during the execution of a teaching process, such as focusing on teacher’s instructions, studying the contents of textbooks, articles and other pedagogical materials, completing tasks, showing doubts, relating to colleagues and so on.

According to the study on Transational Distance, the concept of distance, when associated to education, is analyzed considering other variables besides the physical and geographical separation. The focus of TD is on communicative distance. This is a multi-factor study and is based on what interferes in the relationship between the student and his/her teacher. The factors course structure (S), students autonomy (A) and the intensity of dialogues (D) are understood as qualitative variables that cannot be precisely measured, and their combination guides the organization and execution of courses, independently of the labels Classroom-based Education or Distance Education courses [3].

Keegan [5], based on the work of Otto Peters, Michael Moore and the law of 1971 which regulated correspondence teaching in France, identified the six main elements of Distance Education, which are: the distance between teacher and student; the influence of an educational organization that plans and prepares materials for learning; the use of technical means/media; availability of bidirectional communication; the possibility of occasional meetings in person; the offer of a more industrial (systematized) format of education. These elements are control tools for the factors of communicational distance.

The first initiatives to establish specific pedagogical principles for the Distance Education modality that had as base the elements proposed by Keegan [5] privileged the search of ways to reduce, minimize or even cancel the physical separation between students and teacher, as well as the adoption of technical means to do so. In a second moment, the worry with interaction and bidirectional communication availability was incorporated. In these initiatives, the designs of distance education courses started incorporating the technologies available in each time, which, under a chronological perspective, can be described in generations.

Rodrigues [6], based on the work of Keegan [7], describes three generations. The first one, which predominated up to the early 1970s, was characterized by courses in which the main communication means was the exchange of printed materials, with activities and study units that were sent by mail.

The second generation was from the 1970s and 1990s, when the first open universities were created and the first systematic implementation of graduate courses started. The most used technologies were radio and TV broadcasts through which audio and videotapes complemented printed material. Interaction over the phone also started in this phase.

The third generation started in the 1990s with the introduction of technologies that allowed video and teleconferencing, as well as the Internet as secondary support to communication. Rodrigues [6] observed that there is not, necessarily, a substitution of characteristics from a generation to the other, but that what actually happens is the incorporation and adjustments of technologies.

Taylor [8] expanded this classification by adding two other generations incorporating the technological evolution available in the late 1990s to the courses. The fourth generation was characterized by courses that were completely computer-based and accessible through the Internet, the main means of communication. In the fifth generation, web-based multimedia online interaction was included. It is possible to observe that in the three last generations there has been a continuous movement of courses that were originally based on a rigid structure and without interactivity evolving into those characterized by a higher level of student autonomy and extensive bi-directional communication [8, 9]. If the fourth and fifth generations are considered, [8] as well as the characteristics remarked by Moore [4] and Keegan [5], it can be verified that, nowadays, Distance Education differs from Classroom-based Education by a semi-permanent separation of teachers and students where distance is communicational and overcome by digital technologies that facilitate interaction.

Pierre Lévy [10], in the late 1990s, showed Distance Education as a viable alternative to the classroom-based model, as it allowed the fulfillment of the increasing demand for academic formation as well as the incorporation of technological advances in learning activities. The Internet grew in that context as a content and communication distribution vector due to its speed and low operational costs [11, 12], starting to be used at a large scale, which coined the neologism “Online Learning”, a systematic teaching-learning action through hypertext, multimedia materials, videoconferencing and other communication tools such as discussion forums and online chat rooms.

When observing the evolution of Distance Education, it can be noticed that, given the fast development of information and communication technology, there are several different possibilities to organize courses. Combinations
of different teaching methodologies and digital technologies have allowed infinity of course designs. Therefore, in order to identify the different course models of Distance Education, it is necessary to better understand how the control of factors of Transational Distance allows us to project and build technological and pedagogical bridges to eliminate geographical and chronological barriers.

3. Building bridges

The course instruction design is the project of technological and pedagogical bridges that overcome the physical separation and puts students and teachers together. It acts directly on the typical elements of Transational Distance. In order to better understand these elements and how instructional design works on them, it is necessary to make use of the conception of interaction as described by Moore in 1976. According to it, interaction refers to the inter-relation of people and the environment in a specific situation. In Distance Education, interaction happens between teachers and students in an environment which is characterized by the impossibility of direct relationship between them. That leads to differentiated teaching behaviors such as anticipating students’ difficulties understanding instructions and interacting without non-verbal instructions, as well as differentiated learning behaviors such as the students’ organizing their own study schedule and environment and working without the physical presence of the group.

This impossibility of direct relationship characterized by physical separation leads, according to Moore [3], to a gap in communication which affects both teaching and learning, leaving room for psychological and communicational misunderstandings among the participants of the educational process. Such gap is filled by distance interaction, the base of Transational Distance, which can be present in any educational event, be it face-a-face or not [3].

What is normally described as Distance Education actually refers to a set of educational events in which the physical separation is meaningful to the point of deeply affecting both teaching and learning behaviors. According to Moore and Kearsley [2], this significant separation determines the differences in the way teachers plan, introduce content, interact and evaluate both teaching and learning behaviors. The teaching behaviors promote two factors of Transational Distance, Structure and Dialogue. The learning behaviors promote the factor Autonomy.

The Structure factor regards the elements of the course project or the way that the program is structured so that it can be executed considering the several communication means selected. The courses are structured in different manners, taking into account the necessity to produce, copy, transmit and control the mediated messages. Such factor expresses the strictness or flexibility of the educational objectives, of the teaching and of the evaluation strategies, which describes to what extent an educational program can incorporate or respond to students’ individual needs.

The extension of the structure factor in a program is normally determined by the nature of the communication means employed (e.g. videoconferencing, TV broadcasts, Internet tools), by restrictions imposed by educational institutions (e.g. budgets, infra-structure), by the characteristics of the teachers (e.g. their concepts of education, communication skills, basic abilities with technology) and of the future students (e.g. geographical distribution, availability for the studies, educational background).

As far as the means are concerned, an example of good Structure is content based on recorded TV broadcasts where each word, each activity proposed by the teacher, each minute and each unit of the content are pre-determined. There is no interaction in real time and, therefore, no chance to reorganize the program taking into account students’ contribution. There is little or no chance for deviations or variations according to a student’s personal needs. On the other extreme would be a videoconference-based course with abundant communication between teacher and students, allowing them to reorganize and modify in real time the execution of the program according to students’ learning.

The Dialogue factor refers to the successive interactions developed between teacher and students throughout the teaching-learning process. The concepts of dialogue and interaction are, at times, used as synonyms. There is, however, according to Moore [3], an important distinction to be considered. A series of interactions among individuals constitutes a dialogue when such interactions are deliberate, constructive and valued by all of those who take part in it. In the case of Dialogue between teacher and student, this is always aimed at the improvement of the learner’s understanding of the content. However, there can be interactions between the student and pedagogical material or other interactions, for example, that are subject to misunderstandings, which cannot be considered Dialogue.

According to Moore [3], the extension and nature of dialogue are determined by the pedagogical concept adopted in the course project (e.g. interactionist, constructivist, instructionist), by psychological characteristics of teacher’s and student’s (e.g. introversion, motivation), by course content (e.g. theoretical or practical) and by environmental variables (e.g. communication means, existence of a group).

A relevant variable in the environment is the existence of a learning group, as well as the extension of it. It is more likely that there will be more dialogue between the teacher and an isolated student than the teacher and a student who is in a group or pair. The means of communication is also an important variable. For example, in a correspondence or online course where communication does not happen in real time, each student will establish a private dialogue with the teacher. The fact that it is written causes the dialogue to be more structured and to flow more slowly due to the delay.
between a message and the response to it. However, in a video or audio conference there can be an abundance of real-time dialogue. Nevertheless, if the conference is happening with a group, there will be less dialogue between the teacher and each student individually, the same way it happens in a classroom-based structure.

Regarding the factor Student’s Autonomy, Moore [4] verified, during the analysis of the data of the research that aimed at characterizing Transational Distance, that there were recognizable profiles among the students who finished a certain teaching program or, at least, had a preference for it. There were those who did better at more heavily dialogue-based, less structured courses and those who preferred courses that were more structured, less dialogue-based. He also found a profile of student who used the materials and teaching program in a different way from that originally planned by the teacher to achieve their own objectives. The researcher chose, then, the expression autonomy to describe the characteristic with which the student, not the teacher, determines learning objectives as well as the activities that need to be done in order to succeed in reaching this objective.

Summarizing, it is possible to establish the following measures for Transational Distance: when a program is highly structured and the teacher-student dialogue is inexistent, the transational distance is large. On the other extreme, the Transational Distance is small in programs which include dialogue and a small pre-determined structure. Although there are standards clearly recognizable regarding Transational Distance, there is enormous variation in strategies and techniques, as well as in teaching and learning behaviors. This means that within a set of programs of distance education there are varied degrees of Transational Distance.

Moore [4, 13] proposes in his studies a method of dimensioning Distance Education courses according to the factors structure, dialogue and autonomy, as shown in Tables 1 and 2. “A” means student’s Autonomy, and “N” means the absence of it. “D” represents Dialogue and “S”, Structure. The positive (+) and negative (−) signs indicate the intensity of factors D and S. Moore [13] highlights that the measures are theoretical and that all programs are between the extremes – D +S and +D –S. He also points that the variables are qualitative and that the programs should be classified as more or less distant. The Autonomy factor is influenced by dialogue and structure.

### Table 1. Types of course design according to the factor Autonomy.

<table>
<thead>
<tr>
<th>A</th>
<th>Description</th>
<th>Dimensioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>L</td>
<td>A G E R</td>
<td>Ob</td>
</tr>
<tr>
<td>The student will access resources and guidelines, use literature and other planned sources of information, but he decides what he wants to learn and how, as well as how his success will be evaluated.</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>The student is evaluated through his results by an external agent, but in a competence area chosen by him; the means employed to acquire such competence is under the student’s control.</td>
<td>A</td>
<td>A</td>
</tr>
<tr>
<td>The student, after defining the learning objectives he plans to reach, gets involved in a series of controlled activities, but he himself will evaluate whether the goal was achieved successfully.</td>
<td>A</td>
<td>N</td>
</tr>
<tr>
<td>After freely selecting the learning objectives, the student passes the coordination of the process on to the teacher as well as the responsibility to evaluate their performance.</td>
<td>A</td>
<td>N</td>
</tr>
<tr>
<td>The student controls the execution procedures and the results, but the learning objectives are pre-defined by the course program.</td>
<td>N</td>
<td>A</td>
</tr>
<tr>
<td>The student adheres to the objectives and execution procedures of the course, but the evaluation of learning results will be assessed by him.</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>
The student has some control over the execution of procedures, but the goals and objectives are defined in the course program and evaluation happens through a teacher or external agent.

<table>
<thead>
<tr>
<th>S</th>
<th>M</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common in institutions, especially for professional certification. The learning objectives, the means and the evaluation of the results reached by the students are under the institution’s control.</td>
<td>N</td>
<td>N</td>
</tr>
</tbody>
</table>
A = autonomy, N = absence of autonomy, Ob = objectives, Im = implementation, Ev = evaluation. Adapted from Moore [4].

### Table 2. Types of course design according to the factors Dialogue and Structure.

<table>
<thead>
<tr>
<th>Distance Dimensioning</th>
<th>Course design</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Larger -D-S</td>
<td>There is no dialogue or structured program</td>
<td>Printed books for independent study</td>
</tr>
<tr>
<td>-D+S</td>
<td>There is a structured program but no dialogue</td>
<td>TV-based courses with recorded content</td>
</tr>
<tr>
<td>+D+S</td>
<td>There is dialogue and structure</td>
<td>Courses with material distribution by mail and communication through regular or electronic mail.</td>
</tr>
<tr>
<td>Smaller +D-S</td>
<td>There is Dialogue but no Structured program</td>
<td>Just-in-time courses where students have access to resources and support whenever they need.</td>
</tr>
</tbody>
</table>

D = Dialogue, S = Structure. Adapted from Moore [13]

The combination of factors of Transnational Distance allows different course designs, but these also depend on the pedagogical conception adopted in the project (interactionist or instructionist) and on the combination of technologies that sustain communication and the distribution of contents, such as video classes, printed material sent by mail and the use of Internet tools. One of the ways to analyze the models of Distance Education courses is based on the generations of this type of education and their typical media [5, 8].

However, in the current stage of development of digital technologies, the same media support allows a number of variations of instructional design [14, 11], which makes the classification by generations not very efficient to differentiate course models. Moreover, considering that the means of communication is related to the intensity of the interactions and to the organization of the studies, it becomes necessary to identify the different manners how technology is used in Distance Education.

Simão Neto [15], based on the classification proposed by Paquette, Ricciardi-Rigault, Teja and Paquin [16], identified the ways technology is more commonly used in Distance Education courses, classifying them in types according to the communication and media types employed. This, according to Moore and Kearsley [2] can be understood as a degree of interaction. This classification, which is organized in five different types and is described in the paragraphs that follow, is similar to the ones proposed by Peters [9] and Martins [17]. Paquette et al [16] included an additional type in their classification, the enriched classroom, which, according to Simão Neto [15], is not very well-known and relates better to classroom-based courses. It will be included in the descriptions to support comparisons between Classroom-based Education and Distance Education.

The first type is the online classroom, which has similar characteristics to the traditional model. There is predominance of teacher-talking time; the information flow is from the teacher to the student; students’ presence happens at pre-set times and there are tasks to be completed to the following class. According to Simão Neto [15],
students and teachers, after experiencing distance education for the first time, tend to feel more comfortable in a course offered in an online classroom than in other models. The technologies used in this type of project are, in general, the mass broadcast of the image of the teacher through TV or videoconference to hundreds of classes and thousands of students. In this situation, even when interaction is technically possible, it hardly happens at the appropriate intensity and moment.

The Educational Medias the most well-know model of Distance Education, applied since the times of correspondence courses. A copy of the class gets to the student – letter, audio or video cassette, booklet, CD-ROM or any other. The student studies in a place chosen by him in self-instruction activities. The learner acquires or borrows a certain material and studies it by himself, making use of his own equipment – when technological resources are needed for reading the material – and completing the proposed tasks and activities with or without the online support of tutors. Interactivity is limited to what is permitted by the pedagogical material. Face-to-face contact is restricted to the moments to solve doubts and to correct tests and exercises. When offered, this contact normally happens through a letter, direct phone, toll-free numbers, fax or e-mails.

In the Educational Internet type, the logic behind it is the same as in the previous model (Educational Media), but there is an expansion regarding the means of communication, which are computer-based with students’ being online. The student enrolls in online courses to which he/she has access, and follows the structure and instructions pre-programmed by the course. Tutoring is generally asynchronous. In learning support, the students have access to frequently asked questions and can post his doubts for the tutor and/or the other students to solve. The students submit tests and exercises for correction by e-mail, through discussion forums or by using some other tool.

The fourth type, the cooperative network, is, nowadays, the most common system of distance education. The cooperation among students is the base upon which tasks, challenges and problems to solve are proposed. An interactive environment provides the necessary tools and resources so that the students and teachers can cooperate and complete the proposed tasks. The Internet serves as the main mean and texts, images and multimedia materials can be used as support to the content. The model, however, emphasizes interaction and collaboration over teaching based on pre-produced materials. Tutoring is pro-active and uses synchronic communication (e.g. online chat sessions, audio conferences) as well as asynchronous (e.g. e-mails and discussion forums). The tutor follows students’ activities and starts dialogues with them any time when they realize indications of demotivation or evasion (e.g. constant absences in the online learning environment, delays in handing in tasks, lack of communication with colleagues). There are several online learning environments prepared for cooperation, but, if used incorrectly, simply to forward pedagogical material and pre-programmed instructions for the completion of tasks, the result is the replication of the Educational Internet system.

The fifth type is the Integral Support System proposed by TéléUniversité in Canada [16], which takes students’ autonomy to the limit. Such proposal requires personalized support with procedures and activities carried out by the students being constantly watched assessed. The observation is done by teachers and tutors and it has to organize information, guide and support, motivate individual students as well as groups, promote collaboration and participation, always aiming at the best performance possible. Besides, the students must have access to the support and resources at any time they want (just-in-time) or in groups (just-for-all). It is the institution’s duty to conceive and make the integral support structure available so as to fulfill these three needs.

The enriched traditional classroom is a conventional learning environment in which the technologies are used to increase the access to information and communication. Teachers and students are in the same space at the same time (the classroom) but use the information and communication technologies extensively.

Based on this, considering the classification of ways in which technology is used in distance courses and the factors of Transational Distance, it is possible to identify the most commonly used models nowadays. In order to summarize the aspects which influence such models, we have developed Table 3, which associates the pedagogical conception, the way technology is used and the factors of Transational Distance.
Table 3. Models of the most adopted courses and related technologies.

<table>
<thead>
<tr>
<th>Model</th>
<th>Type</th>
<th>DT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Instructionist, teacher-centered and with few pedagogical resources</td>
<td>Traditional Classroom</td>
<td>+S -D NNN</td>
</tr>
<tr>
<td>2 Interactionist, including abundant communication and varied pedagogical resources</td>
<td>Enriched traditional classroom</td>
<td>+S + D N</td>
</tr>
<tr>
<td>3 Mixed, including expositive classes, varied pedagogical resources and online space as an extension of traditional classroom space.</td>
<td>Traditional Classroom</td>
<td>+S + D NA</td>
</tr>
<tr>
<td>4 Instructionist, Computer Based Training / Web Based Training (e-learning).</td>
<td>Educational Media</td>
<td>+S -D NNA</td>
</tr>
<tr>
<td>5 Instructionist, use of printed material (sent by mail), radio and/or TV broadcast classes with student response through phone, regular mail or Internet and tutoring to solve doubts about the content.</td>
<td>Online classroom</td>
<td>+S - D N</td>
</tr>
<tr>
<td>6 Interactionist, use of tools available on the Internet and eventual videoconferences and online chats, eventual video-classes, hypertext pedagogical material and tutoring to solve doubts about the content.</td>
<td>Educational Internet</td>
<td>+S + D N</td>
</tr>
<tr>
<td>7 Interactionist, use of online learning environment, text/hypertext material, predominance of asynchronic communication and tutoring which solves doubts regarding content, supports and motivates.</td>
<td>Cooperative Network</td>
<td>+S + D N</td>
</tr>
<tr>
<td>8 Hypertext and audiovisual material, prevalence of synchronic communication, Full Support individual support.</td>
<td>Full Support</td>
<td>-S +D AAN</td>
</tr>
</tbody>
</table>

DT- Transnational Distance. S – structure. D – dialogue. A – autonomy. CE – Classroom-based Education. DE – Distance Education. Autonomy refers to the aspects objective, implementation and evaluation, in this order. Source: Martins [18].

The most common models of Distance Education courses in Brazil for graduate courses are numbers five and seven. Numbers four and six are more frequent in free courses and in business training courses. As for Classroom-based Education courses, researches on the predominant system adopted have not been identified.

It is important to highlight that in the organization of DE courses, regardless of the model adopted, the focus of the instructional design must be on the quality of what is offered to students. In this sense, we can list the following guidelines: (1) the student must be the focus of the educational program and one of the pillars to assure the quality of the DE course dialogue; (2) programs, courses, subjects and contents offered remotely require administration, design, language, follow-up, evaluation and specific technological and pedagogical resources that are not a mere transposition of Classroom-based Education courses; (3) the instructional design of the course must be organized according to the characteristics of the target public. The structure and organization of teaching-learning activities must be guided by the necessities of the students and be based on the establishment of communication between learners and teachers, making the necessary effort to overcome challenges. In this sense, besides building bridges that link teaching and learning, shortening distances, it is important to pave roads, creating paths that are appropriate to students.

4. Paving Roads

As previously discussed, there are many formats of courses that are labeled as Distance Education, including different approaches in structure, dialogue and student’s degree of autonomy. However, such elements will only generate positive results in academic performance if there is adherence between course design and student’s profile and behavior.
Studies such as the ones of Allen et al. [19]; Bernard at al. [20]; Chen [21]; Deture [22]; Ryan [23], Schneider and Germann [24], Valasek [25], some of them meta-analysis involving research with millions of participants, bring relevant data related to the success of students in Distance Education courses.

Given the number of participants involved in the studies, it becomes evident that the general tendency is that distance courses start offering the same performance conditions to students that classroom-based courses do. Research shows there are also certain students’ characteristics that favor their success in DE courses. The indicators of success are older age, the development of realistic expectations about the course and the time necessary for studying (motivation and objectivity), work and time management skills, rest management (self-control and serious attitude towards the course), regularity accessing the study environment (discipline) and active participation in online group activities (communication capacity and proactive search for new ways to learn).

It can be observed that the success factors go beyond the technological mechanisms for communication used, the developed pedagogical materials, and the planning of educational activities. It is specifically in these factors that the teacher and the tutor make the difference, as they have a great responsibility in students’ motivation as well as in the development of the necessary conditions for the student to organize himself and interact effectively in the teaching-learning process.

We need, thus, to focus our attention on the action of teachers and students of Distance Education courses. Once distance courses have specific characteristics, especially regarding teaching and learning behaviors, it is necessary for both the teacher and the student to have a differentiated profile. One of the pre-requisites of DE is learners’ autonomy concerning time management and physical space to study even with the help of technological and pedagogical resources, as well as the support of teachers. The correct use and organization of pedagogical materials and learning environments promoted by teachers and tutors is a determining factor in the process. We name this process developed by teachers and tutors as “paving the road”, that is, preparing and monitoring learning paths so that the students can exercise their autonomy in a productive way.

It is important to bear in mind that the focus of Distance Education is on the overcoming of physical obstacles in the teaching-learning process, not on a magical formula that allows learning without the necessary time and dedication to study. Therefore, the relevance is on using methodology and technologies to create flexible and personalized opportunities/moments for studying. In this sense, learning is self-directed and the student himself needs to develop his own learning strategies.

Research [26, 27] shows that the adult student is under the influence of opposing forces during the learning process in Distance Education courses, one that pulls the student closer to the path to learning and another that pushes the student away from this same path. Learning difficulties and barriers in the environment constitute a force that pushes the students away from the learning process, whereas social support and academic performance constitute a force that pulls him closer. Consequently, the addition of these two forces result in the student’s persisting in or dropping out of the course. Landim [28], based on Woodley and Palett [27], reported factors that contribute to students’ drop-out in DE courses. We have adapted Landim’s report [28] in a way that such factors can be analyzed as forces that push the student away:

- **related to course model**: inadequate course format; extremely difficult or extremely easy content; evaluation process is not strict enough; problems with means of communication.
- **related to motivation**: unclear goals – the original objective is not reached. (ex.: someone who enrolls in a course in order to get a promotion at work and later discovers that the promotion does not depend on it); changed goals – change of goals why one studies something; goals more easily reached in another institution; lack of interest or motivation (ex. Need to rest or dedicate more time to family).
- **related to the context in which the student is**: personal/family – accident or sickness involving the family or a member of the family, change in marital status, birth of a child, lack of support from partner, moving home and others; work – increase in responsibility, workload, business travels, irregularity in work hours, strikes, change of jobs, unemployment, etc; financial – losing financial support, lack of support from employer, etc; absence of an appropriate place to study; fear of taking responsibility for self-directed learning.

Many of the reasons for school failure in DE can be avoided, especially the ones related to the organization and execution of the course and/or the ones related to lack of interest and motivation by the students. Therefore, teachers and tutors have a large amount of responsibility regarding the students’ persisting in the course and not dropping out. The tutor, in particular, must know the profile of each student, their expectations regarding the course and their demands. Consequently, it is important for the tutor to be as close as possible to the students through constant dialogue.

As far as teachers are concerned, especially those involved in course planning and the production of pedagogical materials, it is essential that they develop activities and instructions to support learning based on the following guidelines [29, 30]:

- **The tutor/student contact must be promoted.** The pedagogical materials must invite the student to keep frequent contact with their tutor through the resources available. This contact may be to discuss a specific question, plan a project or an assignment to be handed in. If the pedagogical material used does not accomplish this clearly, the tutor may, through the communication resources available, specify to the student how he/she expects this contact to be made;
The deadlines, the execution and the feedback of the activities proposed must receive a lot of attention. The students need exact, detailed information on when and how to present the result of their learning. Items such as what should be submitted, where to send it to and how long to wait until feedback is given with comments and evaluation need to be defined and informed beforehand. Studies show that a two-week deadline until feedback is given has best results with students in terms of motivation. On the other hand, activities on which no feedback is given may demotivate the student. The teacher and/or the tutor should monitor deadlines and pay close attention to the feedback given to students. They should guide those students who show difficulty following what is proposed. Most importantly, the tutor must inform the coordination of the course or the responsible teacher about the difficulties the students may have and about the eventual need to postpone the deadlines proposed;

Clear criterion for the evaluation of the activities performed must be established. The pedagogical materials must inform the student the criteria that will be used when assessing their work and to which aspect of the answers more emphasis will be given. On the other hand, the tutors, when correcting/evaluating students’ work must be explicit that the grades given are in agreement with the criteria, justifying the score given;

All the specificities of the evaluation system must be clearly established beforehand. The materials must provide clear and complete information on when and where students will be examined; the types of exams they will have to take (multiple choice questions, dissertative questions, articles, etc.), which content(s) the exams will cover and the percentage of the final grade that the exam represents. The tutors must know all the details regarding the in-person meetings beforehand so that they can inform and prepare students properly.

All the people who have direct contact with the student must be cordial, honest, empathetic, organized, ready to support and ready to “listen”.

In this context, we emphasize the importance of the development of application activities of the content in the written and audiovisual pedagogical materials, which, from now on, we will call Study Activities (SA). The ideal would be that there should be SA related to the main concepts to be studied. It is also important that SA promote constant interaction among the student, the pedagogical material, his colleagues and the teacher. The SA should also compose the system of evaluation of the course. It is preferable that fewer activities be developed with a higher level of complexity, contemplating the several aspects related to each unit of study than activities developed for simple and fragmented actions as these not only do not challenge but also demotivate the learner.

Besides that, according to Demo [31], Neder [32] and Santos [33], it is important to break the culture of evaluating through specific events and to turn evaluation into a continuous process followed by efficient feedback that allows the student to redirect and rethink his progress and his learning tasks. Therefore, it is essential to transform the Study Activities weekly developed by the student into evaluation and self-evaluation tools, carefully observing each action and manifestation of the students.

Therefore, when planning the course, the teacher must choose the type of work to be proposed so that the student demonstrates learning. In the choice of activities, the teacher needs to analyze if the material offered is enough to complete the tasks or if further research will be needed. The material must, at least, be enough to provide a starting point for the execution of activities and have the basic elements to be applied.

5. Final Considerations

In this chapter, we have tried to discuss the specificities and the differentials of Distance Education as compared to Classroom-based Education. Furthermore, we have also described in detail the models of adoption of Distance Education according to the set of technologies used under the perspective of physical distance, considering that that are countless variations in course mediated. We have also discussed the aspects related to the behavior of teachers and students in the context of Education mediated through ICDT. The theoretical grounds are those of the work on Transational Distance by Michael Moore and of that on defining elements by Desmond Keegan.

We have tried to show that the differences between Distance Education and Classroom-based Education are becoming more and more subtle and the physical separation of teachers and learners in terms of geographical distance and/or time is no longer a good parameter to identify these educational systems. Information and Communications Technologies – ICDT – already offer diversified and low-cost methods to reconstruct online many of the classroom-based interactions that are necessary in the teaching-learning process.

In the school context, the facilities created by ICDT and by Distance Education offer a change in the way people interact with each other and with the educational content, allowing more learners’ autonomy with activities and with learning strategies. This allows the adoption of teaching methods that differ from those normally used in classroom-based courses, which has favored the effects of the Distance Education modality over traditional education systems. The travel in search of learning has become more comfortable and pleasurable with well-projected bridges and well-paved roads.
References


