Design a course supported with multimedia and online learning: The adaptation as a fundamental.

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Abstract: In this work we are going to share some reflections on learning in general and on the learning of foreign languages in particular, both of which are dependent on the context in several levels, learning styles, and both the input and output material's format. We will confer an essential role to the discernment between informal and formal learning as a means to the development of a lifelong learning capability. Since we consider real learning to be built on the basis of social and personal research experiences we will consider this capability as an element to bear in mind when designing an online course and one as much or even more important than the acquisition of contents. Let us not forget that the development of cognitive learning abilities is essential.

1. Introduction

When we face the star of an online course, a b-learning course or a face-to-face course with an LMS (1) Platform, we should always ask ourselves: What do the students need? What are their expectations for this course? What specific objectives must be taken into account? Whenever we face these questions in regards to program content certain needs always arise.

In doing so however, have we thought of the learning needs of each student in particular? It is very likely that our students will not apprehend the information in the same way we do, and that their way of organizing the contents might differ considerably from the way in which we would do so. We will examine later various theories concerning learning methods which give reason to believe this.

On one hand, we should ask ourselves if the text formats determine our ability to select, organize and acquire contents. If this is truly the case, we should also apply these considerations to our classroom practice. Following this line of questioning we should ask ourselves when it is exactly that our students learn. Following the theories of both the informal/formal learning, we observe that students acquire large amounts of knowledge outside the classroom. This much higher level of information acquisition is, in a hyper connected society in many cases much more predominant, outside the school hours. Nonetheless, we should keep in mind that within a competitive academic context, formal learning is combined with other learning methods, in which (for some models) classification is the determining axiom of their results. On this point the theory of learning methods converges with that of informal learning. Taking this into account we propose a vision of education that is intended for formal education (through the so-called LMS), but that de facto occurs in the informal learning process (through social networks and real tasks to be undertaken outside the course)

This entire spiral converges invariably on an essential concept intrinsic to education: adaptation.

2. Adaptation

Nowadays, as education expert insists Sir Ken Robinson, today we consider university education to be mass or industrial education. Despite this concept, not being, per se, detrimental to the student in our opinion, it is necessary to clarify it.

One of the greatest advantages of e-learning education is increased access to university education. However, this advantage presents some difficulties.

On one hand, not all candidates have the suitable profile necessary for an entirely online education and they can get to the frustration in the course (Borges, 2005). Whereas the profile of the university student rapidly becoming commonplace exhibits the ability to select information through multimedia elements, hyperlinked texts, web search of information, etc. However, from the point of view of reading comprehension, we must be cautious and remember studies like those conducted by Grimshaw, Dungworth, McKnight and Morris (2006) in which no marked differences between digital reading and traditional paper (2).

If our goal is to reach more potential students and, furthermore, to enable the success of such students both in their formal education and in their subsequent professional experience, it is we who should adapt to them and not the contrary as often happens. Adaptation has to start in the university through the study of the learning processes and mechanisms, of the studied contents and the way they are exposed. To expect the students' adaptation to each professor constitutes a pedagogical incoherence, visible in the relative effectiveness of one

person's adaption to a hundred when compared to the reverse of this. Furthermore, we should take into account the advantage it poses for an educator to be an expert not only in the subject matter he must communicate, but also, in principle, whose familiarity with the methodologies applied to the learning processes, will be enable him/her to face the entire process with a more adaptive perspective. For example, though we educators learn in a specific way, we cannot expect our students to acquire knowledge in this same way, especially because the approach to receiving information, organizing it, saving it and even memorizing, has been radically transformed. The information is not anymore to be found in one single place, but is accessible everywhere. Thanks to mobile devices with Internet capabilities, the information handled by our students, may it be personal, cultural or social, is available to them anywhere. This represents a significant change in the way the information is received.

Taking all these changes into account, whether those pertain to reading techniques, ways of locating, selecting and distributing information, or those associated with the digital gap still present as a consequence of issues related to age bands, we think that adjustment should be the essential axis of university education both on a external perspective (format, multimedia and hyper connectivity) and an internal one (learning styles)

2.1 The students

As mentioned before, adaptation should reach the university through the course programs and methodologies, whether this be online, face-to-face or face-to-face whit internet support.

In regards to the adaptation to students, we should basically bear in mind the learning methods and techniques. These refer to the way students receive and organize information. It seems to be clear that not all students develop the same abilities in acquiring contents. On one hand, there are students that feel more comfortable in his/her learning process when the information is well organized and detailed, and on the contrary, there are also other students, equally valid to the learning process, acquire contents in a less organized way.

Thus, broadly speaking, a learning style is the technique or mechanism that each of us has to learn. These mechanisms, at the same time, are constituted by an aggregate of strategies used to process the information that is presented to us. In other words, to know which learning method is appropriate for each student, we should ask ourselves what the student does when assimilating and producing information, and how this is done. Is information selected, absorbed without distinction, or organized, etc.

There are currently several models of classification of learning styles, all of them valid from different points of view (3). However, all of them concur in some important aspects.

In the first place, for work with learning styles and strategies to be as effective as possible, these need to be explicit and known both by the student and by the teacher. If a student is conscious of the tools being used, it is to be expected that such a student will also be able to manage and shape them to his/her benefit.

Secondly, this is an active process (learner) The strategies, as we mentioned in the previous point, should be consciously adopted, however it should also be taken into account that the attitudes assumed when faced with a problem constitute an active process, in which the student should take part. It is the responsibility of the educator to assist the students in finding the learning techniques that suit them and those from which they can take the most advantage, as well as to show them the best available strategies with which to confront the information that they seek to acquire.

Thirdly, in relation to the previous point, the learning styles are not stable. They change depending on the degree of cognitive maturity of the student.

Lastly, there is no one defined method for each student; instead there are method tendencies. Statistically, a student does not fall within a single method, but combines several. It appears to be clear that no one can be confined into only one learning style.

Finally, regardless of the learning method we choose, it should always be kept in mind that our students will have varying reactions to the content. This compels us to choose a presentation method.

2.2 The educational content

In the same way that we should adjust ourselves to the student insofar as social agent (4) and learner according to their learning style, we should also adapt to the context in which the learning takes place (5). Though this might appear to be obvious, for some colleagues in this profession it is not. It is evident in the sphere of higher education that many of the educators, who exercised their roles within face-to-face education or through distance education, have not been able (or were not willing) to mold their face-to-face methods to fit those suitable for online education. We subscribe to the idea that the paradigm of online learning presents many differences to the face-to-face (Levengerg & Casp. 2010). The materials have not yet been modified or have simply been transferred from a paper format into a pdf file. Nonetheless, we know that our brain acts and

interacts in different ways when we are working with a paper text as opposed to in front of a computer; where we are prey to constant interruptions, hyperlinks, background music, etc. (Small et alii, 2009). However, this does not mean that working on the net is more productive from a neuronal point of view, it only means that it is different and that the neuronal system activates certain connections, which are not active while working with a paper text or a text without hyperlinks.

In any case, differences exist, and it is for that reason that we believe in the examination of the vision of education and its methodology in regards to the contexts of online or face-to-face learning.

From our point of view, in a context of online learning, texts that are not natural to that environment should, while not being prohibited, be avoided. Thus, we believe that in an online learning context it is appropriate to offer our students text with multimedia elements, such as video, image-based audio, etc. By constituting a type of communication that is much closer to its educational context this type of text will greatly assist the online learning process (6).

We must not fail to bear in mind that in completely online learning the content production, as well as tutor guidance are very important. As we already know, the pragmatic formula for Internet behavior is not the same as for other communication media. In messages through a LMS platform, among which we will consider email and answers in forums, the answer may take longer than a phone call, which can cause a certain frustration in the student, frustration that should be avoided. It is therefore important to keep an open and constant line of communication with the student, either through the university e-mail, the platform or the social networks that can bring us closer and ease the lack of communication.

2.3 The materials

As we have mentioned above, from our point of view the materials constitute a cornerstone of online learning and are one of the main differences to be taken into account while organizing and designing an online course. In addition to the content their representation should be adjusted to the environment in which we are offering them to the students. In regards to the adaptation to the educational context, unless we change the materials and target task with which we work in an online course it will be a useless transfer of the materials used in a face-to-face or distance course, fit only for the sheer massification of education.

There is no question of accelerating the learning process through multimedia materials since this process does not have to be faster, but simply more effective, as it is mentioned in the interesting and informative article by Fernández (2001) that collects the myths of online learning, many of which have not yet lost their presumed validity. We will also discuss one of the functions we consider crucial in the development of the lifelong learning process.

Following this train of thought, while they lose their validity in a face-to-face learning context as a consequence of the reasons mentioned before we consider the multimedia materials to be more effective within a context of online learning.

Nonetheless, we do not believe the multimedia material to be a solution in itself. We should always reflect on their design and the learning application. Accordingly, the results of learning with the help of multimedia elements and hyperlinked texts are not yet clear.

A trait agreed upon by the majority studies dedicated to the processing of information through multimedia elements is that certain kinds of materials are not advantageous for the long-term acquisition of information due to inclusion of audio in a visual text. The argument to back this theory is that both those processes are related to different sensorial modalities. Following this, Schnotz (2002) notes

> When a learner listens to a spoken text, music or sound, the information reaches the auditory working memory and results into a superficial auditory representation of the text or an auditory perception of sound or music. In the auditory comprehension of a text, the information is interpreted as a sequence of verbal symbols and triggers the constitution of a propositional representation. While listening to music or sounds, the information is interpreted as an "auditory image", which can be mapped within the corresponding mental model. (13)

We must recognize the nature of the represented text, its cognitive load, may this be visual or auditory, and the way this visual or auditory text is processed by the learner.

Distinguishing the various channels through which we process certain kinds of information in a specific text is a very interesting matter and one that requires adequate attention, considering that, from our point of view this is one of the main issues when designing a multimedia text.

Therefore, in the same way that we have an instructional theory for formal and face-to-face learning, we must have a theory that emphasizes in particular the attributes of this popular means of communication. One of the most interesting theories in regard to this is the *Cognitive Theory of Multimedia Learning* (7) (Mayer 2005)

Mayer formulated this theory that can be briefly summarized in three assumptions that will be fundamental to create, select or discern between these kinds of materials:

On the one hand there is the assumption of the *double channel*: the visual channel and the auditory channel. This hypothesis is based on the double codification theory of Paivio & Clark (8) (1991) which proposes that a type of text, either written, visual, visual/written or pictured/auditory is processed in a determined channel. Following Mayer, we can conceptualize the differences between these two channels from two different perspectives. Firstly, that of the representation mode and secondly, that of the sensorial modality. From the perspective of the representation mode we can separate these channels into the verbal (spoken or written words) and the non-verbal (images, videos, animation, etc.). According to the sensorial modality standpoint, the texts are to be differentiated depending on the way the recipient processes them, whether through vision (images, animations or written words) or through the auditory system (spoken words, background music, etc.).

These distinctions do not signify that the learning process can only occur within one unique channel, but they do imply that there is a slight preference for one or the other, allowing the possibility of a combination of both open channels. According to the skills of the learner related to the subject, they may from that combination a broader frame of knowledge and interrelated contents.

Following these instructions while creating and selecting materials we should have in mind which channels we want to involve in order to transmit the desired information to our student without interferences.

Further on we find the hypothesis of the limited capacity. This hypothesis is based on the idea that the human being is not an information recorder, but that the amount of information that is able to process is limited. According to some experiments covering information retention relating to numbers. In a classical Miller's paper it seems that the average digit retention is usually not above seven (9)

As we know, nowadays the assumption is in vogue, that we have become due to our exposure to social networks, accustomed to a certain kind of text, and that this has reduced our attention span for longer texts (Carr, 2008). Ideal are short and straightforward texts, avoiding ornamental redundancies that distort the message.

Finally, the assumption of active processing is formulated. This theory is connected with the communicative approach of the CEFR, in which the learning process is considered as an active process, in which the learner interacts with the information and fills the informative gaps according to her/his cultural background. The more information the learner possesses about the subject, the more capability for acquisition will he/she have.

One of the greatest criticisms of Mayer's theory is that it completely disregards the emotional level of the learner (Vigotsky, 1988). This is that the learner lives in a society with determined values learned in childhood, and that he/she has a social and emotional context that can easily vary. This criticism concurs with the model of learning methods.

Despite this criticism, we believe that excepting the disregard for more personal aspects, this theory does not fail to present a valuable perspective when selecting materials for our students.

Regarding this, it is our opinion that the selection of different ways of presenting the content and of undertaking the tasks must be considered when designing a programmatic content, even when the end task is always the same.

2.4 The format of the final tasks

According to these final adjustments of the learning methods, of the instructional context and the materials, the final tasks should follow the same line. For example, if we normally work within an online environment, the most appropriate choice will be to design the end tasks in that same format (video, audio, text or multimedia). In the case of lesson content for presentations in Spanish we take advantage of the social context of the social networks in order to help the students create real material in the foreign language within a truly communicative context. No more fake simulations in the language courses (11).

We also believe that, as in the presentation of contents, we should give the students the freedom to choose the format for presentation of their final task. Whether their preference denotes audio, video, written, etc. This is about the student being able to select his/her own way of exhibiting his/her acquisition, in this case acquired language skills, which may even become a part of a repertoire put to use within a close working environment.

3. Formal and informal Learning

Within the adaptation of the different elements to be taken into account for the lifelong learning process, we find the classification between formal and informal language. In the case of foreign languages, informal learning is a very important element, considering the often-surprising ways in which students use words that we did not teach them. This is one of the most important objective of all learning processes; the student as an autonomous learner, the student who becomes independent from the teacher as a guide for learning and begins to acquire knowledge as a matter of emotional affinity.

Following this, and without aiming to enter the debate between the limits of formal and informal learning (12), we define formal learning as that in which development is controlled and which takes place within an educational institution. While informal learning, as mentioned before, takes place apart from and without a link to an educational institution.

3.1 Formal Learning.

There can be no doubt that within a competitive society an explicitly formal form of learning is needed. Formal learning saves the student time spent otherwise in often frivolous individual research by allowing the tutor to act as a guide throughout the entire learning process. However, this kind of learning process should still retain as its ultimate goal the independence of the student and the figure of the autonomous student. We should focus our formal online course on creating a bridge towards informal learning, considering that only in this way can the objective of lifelong learning be reached. In accordance with this, the exercises proposed to students should demand a high level of reflection, the posing of hypothesis, verification and focused on the reality through the social network.

3.2 Informal Learning.

Informal learning, as we have mentioned before, is the ultimate goal of all teaching methods. The importance highlighted here increases when we are discussing learning processes involving the internet, due to the higher level of content acquisition when working in this context. A student who works on the Internet is profoundly better prepared for autonomous learning than a student who has only been trained with face-to-face methods. While participating in an online environment, the student connects to the information on the Internet and therefore develops skills distinct from a student who depends on a tutor for the acquisition of contents. Thus, before preparing an online course we should reflect on the implications inherent in each type of training method.

From our point of view, we believe in the implementation of the use of social networks as an essential element in informal learning. The usage of these tools enables the information to flow in a much faster and more effective way, not only from the perspective of the acquisition of content but also when considering the creation of relationships between classmates and the teacher/tutor of the subject.

In the class *língua espanhola III and V* of the Portuguese catholic university, we have implemented the use of Facebook as a tool for informal learning. In this way, the teachers/tutors can release information to the students, who can later decide whether to read it, watch it or listen to it, according to their own preference. This information can, at the same time, be shared and commented on by the remainder of the classmates. Included on this account are both students from the current course and students from previous years, the aim being to create an integrated community of Spanish speakers that come together to share information in a non-evaluating environment. The student takes part in a non-institutionalized group and in this way creates an emotional bond with the Spanish language. It is advantageous to interact with students through the same account they have for personal use, thus dissipating the border line between formal and informal learning, as opposed to other applications, such as Edmondo, that mimic the aesthetics and the functioning of the above named social network, but in which the students must create a special account. Such fluidity creates an illusory information exchange, disregarding the language in which the text is written. This represents a transition towards the real autonomy of the learning process.

The use of social networks is another key issue to enhance informal learning. However, this is a subject that will not fit here developed.

3. 3 Lifelong learning

The last type of adaptation of which we wish to speak is adaptation to the labor market. We are all aware of the tremendous changes that have taken place within the labor market in the past 50 years, however: has the university changed? Have the contents been altered? Has any kind of approach to the characteristics of the labor market been made?

We know that one of the main characteristics of the present labor market is the necessity of learning- and adaptive skills tuned to technological changes. Basically, as the last step towards the labor market, it is the University that should guide us in this matter. With few exceptions, universities do not currently offer this possibility.

We consider that universities should invest far more effort in the development of lifelong learning skills. This ability can be improved to a very high degree in connection with teamwork, and with regard to forums or wikis in an online environment. By learning how to use the various social networks that enable us to connect with and to learn from each other, we will be able to awaken in ourselves the ever-present necessity of constant learning with aims to improve our work productivity. Obviously, online learning is not the panacea, it provides however, not only invaluable help from the standpoint of learning in the most didactic sense of the word, but also the possibility of studying in any university from any part of the world without our residing there

4. Conclusions

With this work we have tried to provide some basic guidelines regarding what we consider to be a properly conceived course both in an online context and a face-to-face context based in an online platform.

We wanted to highlight the relevance of course adaptation from the perspective of the various elements, that are, in our opinion, essential for the design of an online course.

We believe that an online course must differ in some methodological aspects from a purely face-to-face course. Some of these aspects being the preparation, selection and creation of materials; dependent on the context in which they are to be offered by the teachers/tutors.

In addition we have attempted to highlight the importance of training the skills that refer to autonomous learning and, therefore, to lifelong learning. This is an aspect we believe to be fundamental when designing an online course. This is an excellent environment in which to give instructions to our students and for them to be able to reach the main objective of any learning experience: learning how to learn.

Endnotes

(1) In the Portuguese Catholic University of Lisbon, there is a degree in Philosophy in b-learning and the Spanish's course which is face-to-face learning, but has a heavy workload exercises and online tasks in the Moodle platform. These tasks can be performed outside of this platform. Therefore, the platform is not the principal place in which students work but on the web.

(2) "The comprehension scores were not significantly different when the children read the electronic versions of the extracts compared to when they read printed versions of the same." (p.596).

(3) For more background, Recommend the consulting "Manual de estilos de aprendizaje" in http://www.dgb.sep.gob.mx/informacion_academica/actividadesparaescolares/multimedia/Manual.pdf.

(4) The approach adopted here (…) views users and learners of a language primarily as 'social agents', i.e. members of society who have tasks (not exclusively language-related) to accomplish in a given set of circumstances, in a specific environment and within a particular field of action. (A Common European Framework of Reference for Languages. Learning, Teaching, Assessment. Council of Europe.)

(5) By context of learning, we refer to a formal context within online and/or face-to-face learning..

(6) For example, in a face-to-face foreign language course we believe it to be more appropriate to practice the oral skills while avoiding both research skill development as well as the exposition of video and audio. This does not only represent an adaptation to the environment but also the advantageous use of the context in which we are working. Video, audio and research should be undertaken within a much more suitable context. The context we refer to here is the customary study environment of the student, in which the audio can be listened to with headphones; the image can be seen on an unshared screen. Here the research can be conducted through the Internet without having to think of the time remaining until the class will end, freeing the student to visit different social networks in order to rest from the work whenever necessary. Although this might appear to be a contradiction, it is not such a large one if we interpret it from the point of view of advantageous use of environment. In a university course, the hours dedicated to each subject are quite limited and so long as this is the case we must encourage, à priori (as we will see later) our students towards autonomous learning and, therefore, that they should conduct their research outside the classroom. In the realm of foreign languages, this becomes essential, as we all know the limitations that the teaching of a language present when trying to practice oral communication. Nevertheless, they offer several advantages when exercising written production as well as written and oral comprehension. In the case of an online course, this division of the work according to skills becomes less important. Furthermore, the use of the appropriate material is essential. The teacher must place a greater emphasis on enabling the students to work, investigate and elaborate projects using the Internet. Far from seeming a truism, it is very important to dedicate at least the first week of the course to the training in the different skills that will be necessary for this to development. To cite a concrete example; if we want the students to practice their oral expression in a language class, we should teach them to use the recorder Audiacity. In regards to this, we recommend the use of tutorials like Captivate or other similar programs of video and audio capture, aiming always to put them at

their disposal for work and in a way much more practical than the simple pdf format with a screen shot of the sample work. This method of education is essential for older students, who have never used a recorder, since they have never needed it. Even in the case of the students from the younger age ranges we should remember that the majority of them are great Internet consumers, however very few of them venture to participate in a collaborative way within the network, and for that reason production of material must also often be learned..

(7) Extracted from the article translated into Portuguese of the compilation *Ensino online e aprendizagem multimédia*. (p. 207- 237).

(8) According to Paivio (2006) "Cognition according to DCT involves the activity of two distinct subsystems,(...), a verbal system specialized for dealing directly with language and a nonverbal (imagery) system specialized for dealing with nonlinguistic objects and events.".

(9) According to Miller (1956) (...) the span of absolute judgment and the span of immediate memory impose severe limitations on the amount of information that we are able to receive, process, and remember (...). (p.12)

(10) In one example extracted from the support course of *língua espanhola III*, we can work on the content to express prohibitions in Spanish. The contents are here presented in learning tables, with samples of real Spanish taken from street signs, inside institutions or from interactive format materials such as audio, video or text as these materials created by teachers or with links from the Internet. In this way the students are able choose the best way of understanding the expression of prohibitions depending on their own learning method.

(11) In this way, make students to work outside the platform, as this will be the ultimate goal of teaching: the independence of formal education..

(12) To better comprehend this difference we recommend the article by Colley et Alli Non-formal learning: mapping the conceptual tercian. (2002) en http://youth-partnership-eu.coe.int/export/sites/default/youth-partnership/TALE-Documentation/Documents/Phase_3/ELU_5/Tale_ELU5_NFL_Mapping_the_conceptual_terrain.pdf.

(13) Translated from Spanish version.

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