Teacher training in virtual learning spaces[1]

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Abstract: The incorporation of information and communication technologies transforms the time and space in education. These technologies permit the creation of virtual learning environments which can be utilized using a wide range of educational methodologies. We find ourselves using e-learning practices related to not only processes of information transmission but also collaborative knowledge building. The majority of research shows that the success of virtual learning environments depends a great deal upon the role the professor or teacher assumes in the course. In these environments, the teacher's role changes notably and becomes a determining aspect in the realization of successful educational activities. The principal objective of this article is to highlight some of the aspects related to the basic competencies that are used in virtual learning environments, aspects that need to be considered in relation to the student's formative training as a teacher-trainee.

Introduction

Over recent decades, as Martínez (2003) points out, there has been little change in the teaching model. In this manner, it has survived the advances society has made. However, Information and Communication Technologies (ICT) create a new scene, one that requires a profound revision of education in all its aspects. The fact is that the form teaching takes, its methodologies, the manner in which knowledge is accessed and acquired, and the resources used (amongst other things) are affected by these new technologies.

The introduction of ICT to the context of education might bring benefits to the education system as a whole, to students, to teachers and to the education community in general. With respect to teachers, these technologies put a diverse range of technologies at their disposal: software, documents, web pages, etc; they facilitate participation in teaching networks; and they enable closer collaboration in projects with other education centres (Crook, 1998; Harasim et al, 2000; Hepp, 2003). One of the emerging possibilities that come from the use of these technologies when installed in centres of education is the use of virtual learning environments (VLE) in supporting the work of the teacher and extending the class beyond the parameters of the classroom. Furthermore, virtual learning environments are useful to teachers who wish to develop in a continuous manner, particularly when participating in educational experiences that are centred in constructivist educational perspectives of socio-cultural origins, where the interaction

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between partners, reflection and the construction of knowledge in a collaborative form become central aspects of teaching practice.

The initial training of the teacher must not ignore these new spaces of virtual learning. The performance of the teacher should not be thought of as being one that is situated within the physical space between the four walls of the classroom. The role of the teacher is going to continue to change in a conspicuous manner, in that this new method of teaching supposes a style that is a lot more centred in the design of learning contexts and situations, in mediation and supervision, and in communication strategies.

The fundamental objective of this article is to analyze the teaching needs of teaching staff during their initial formation as teachers in a context where continued emphasis is given to the creation of spaces of virtual learning.

The education of the teacher as the designer of new learning spaces

Papert (1996), claims that the slowness with which change is taking place within educational institutions, provides us with the possibility of making the following comparison. Imagine if a century ago we had frozen a surgeon or a teacher and that we were now able to bring them back to life. The surgeon would enter the operating theatre without recognising either the operating theatre as a space or the instruments with which he should have to operate and, in effect, he would be unable to work as a surgeon. What would happen with the educator? Well, as Papert points out, the teacher would not only recognise the classroom but he would still be able to find the chalk and the blackboard, discoveries that, as it turns out, would enable him to return to teaching.

This concept of both the classroom and teaching itself describes the present day situation we find in the majority of schools. In response to this reality, Papert (1996) urges that we move to change this teaching model and incorporate into teacher-training tools that will capacitate the teacher as a professional who, in his or her purpose, might be much closer in profile to a knowledge builder, a designer of learning environments rather than accepting to be nothing more than just a transmitter of information.

The teachers that we train are going to find themselves with students who belong to the new generation, a digital generation in which information and learning are neither controlled by the walls of the school or that which is offered exclusively by the teacher. The principal problem for teachers of the digital generation is that modern society has changed very rapidly and the teacher finds himself in a difficult situation: while there have been very few changes with respect to the structure and management of the school, society itself has changed rapidly and children today actually require an altogether different type of education. Today's teachers have already been trained in relation to a culture and a vision of their profession which have themselves already changed.

The teacher in the educational institution has the freedom to make improvements or, on the other hand, not make modifications to his practice. Nevertheless, while teachers do see how the schools have to change and how they themselves as teachers need better training in order to confront the changes that surround them, they lack the capacity to introduce the necessary modifications as long as it depends – in the majority of cases – on will alone. As Marcelo (2002) confirms, the isolation of teachers is obviously enhanced by school architecture, as it organises school culture into standard

modules, defining not only the distribution of time and space but also the norms of independence and privacy experienced by teachers. Marcelo (2002) says,

> Isolation, as a norm and an aspect of professional culture has both some advantages and some obvious disadvantages for teachers. While, on the one hand, it facilitates individual creativity and liberates the teachers themselves from some of the difficulties associated with shared work, on the other hand, it deprives the stimulation that comes with working with one's companions, something that stifles the necessary support that one needs to progress throughout one's career.[2]

The changes that are taking place in society have an influence on the demand that there be a redefinition of the work of the teacher and of the teaching profession, of teacher-training and of their professional development. The role that the teacher has traditionally assumed in teaching has been the consequence of a curriculum that is characterized by its academic contents, contents that are unsuitable for the context we find ourselves in today. Today, information reaches students via multiple paths (television, radio, Internet, etc) and teachers cannot ignore this reality. Salomon and Globerson (1992) suggest that the metaphor for the teacher who acts as a transmitter of information is that of the flute soloist who plays to a not so respectful audience. Salomon and Globerson say that other metaphors for the teacher who transmits information could be the designer, the tourist guide, or the director of an orchestra. From this perspective, the role of the teacher must change from that of the simple conception of the distributor of information and knowledge to that of the person who is capable of creating and orchestrating the management of complex learning environments, a concept of the role of the teacher that now implicates the students in activities appropriate to that which would enable them to construct their own comprehension of the course material. Throughout this process, the students are accompanied by the teacher in their learning process.

Understanding what one learns and to learn how to learn are two of the most repeated aspects of the entire bibliography on this subject, and these precepts are just as applicable to students as they are to the teachers themselves. Change for teachers, does not necessarily bring the teacher closer to understanding their learning process and, for this reason, this understanding must instead be governed by the intentions of both the teacher's initial training and their ongoing professional development. These changes become more defined as a result of gaining this different understanding of the education process, something that is demonstrated in the figure below:

	Traditional learning	Information society

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[2] Original citation is: "El aislamiento, como norma y cultura profesional tiene ciertas ventajas y algunos evi dentes inconvenientes para los profesores ya que aunque facilita la creatividad individual y libera a los profesores de algunas de las dificultades asociadas con el trabajo compartido, también les priva de la estimulación del trabajo por los compañeros, y se deja de recibir el apoyo necesario para progresar a lo largo de la carrera"

Learning	Transmission of information	Centered in situated learning
	Hierarchal model	Cooperative
Learning model	Transmission and comprehension of knowledge is predictable	Scaffolding

Evaluation process (Transformation as a value) |
| Curriculum | Fixed | Flexible |
| Exercises | Sequential materials

Fixed | Authentic |
| Grouping | Individual

Competitive | Collaboration

Communities of learners |
| Tools | Books

Paper and pencil | Multiple formats: books, multimedia, Internet, etc. |

It is obvious that most of us will recognise the details of the column that refers to traditional teaching, whereas, the elements described in the column that refers to the information society are still considered to be incipient. The initial formation of the teacher trainee has to be designed in such a manner that permits the creation of the competencies that will enable formation of professionals who not only master the didactics specific to the different course materials but who also acquire a series of educational interdisciplinary elements that have appropriate use across the entire education sector.

Along with the capacity to learn, an element that also must be considered to be of great importance is the capacity to respond to the contemporary challenges faced by the schools, the capacity of teachers to lead. For example, a teacher has to understand how a 'knowledge worker' and a designer of learning environments must have the capacity to profit from different spaces where knowledge is produced. The teaching profession should be characterised by that which Wenger (2001) denominates as a community of practice where the experience of the individual is converted into a collective experience. The teacher's profession is a profession that needs to change its professional culture for the reason that it is obstructed by both its isolation from society and its difficulties to both learn from others and with others; where it is not seen as a good thing to either ask for help or recognise difficulties.

Some are beginning to have interesting experiences in which it is demonstrated how the use of new technologies are able to facilitate enormously the work of both the teachers themselves and their training. The creation of virtual communities in order to share knowledge and resources such as the creation of shared spaces for practice are an example of this development.[3]

As has been said in the European report 'Learning to Bridge the Divide' (Organisation for Economic Co-operation and Development, 2000), ICT allows for the development of a new complementary relationship between

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[3] Some teachers have managed to familiarize themselves through their involvement in the evaluation of software, in this way converting themselves into well informed users of the German/Austrian system SODIS (Software Documentation and Information System). In the initiative made by the United Kingdom TEEM (Teachers Evaluating Educational Multimedia), teachers inform students on the use of software in the classroom and evaluate comprehension in the process.

formal learning in the school and informal learning outside of it. In order to reach this stage of development it is necessary that the teacher be educated in the use of tools and methodologies that can be applied in the learning context so that students might bridge these forms of learning. In this sense, a key element in their training is the learning of strategies that enable one to manage virtual learning environments.

As we pointed out previously, this doesn't only involve the learning that takes place inside the school walls but the design of virtual spaces that permit learning that extends the student beyond the school walls. To design virtual environments and to act as a tutor in these environments is not an easy job and, as such, must form a part of the initial training of the student teacher.

The role of the tutor in virtual learning environments

The impact of ICT on communication is such that it is designated as Communication Measured by Computer (*Comunicacion Mediada por Computador*) (CMC) in all situations where there is synchronised and non-synchronised communication realized with technological equipment. In recent years the use of CMC has grown rapidly, especially in its non-synchronised modality (Tolmie & Boyle, 2000). When this communication tool is incorporated into education and teaching processes in the appropriate manner, and when this process is well supported, there is the possibility that this process can favour the collaboration of "an interactive and collective process of the production of knowledge where students produce knowledge by actively formulating ideas by hand and which are constructed and shared as a consequence of the reactions and responses of others" (Harasim et al, 2000, p. 24).[4] In this manner, we find ourselves before the possibility of creating learning environments that provide the possibility of collaborative work, boosting the construction of knowledge in a learning community. This promotes spaces for reflection that are accessible at any hour, that are adaptable to the individual learning rhythm and, above all, that are opposed to the classic form of transmission of knowledge from the teacher to the student.

The education experiences that use these virtual learning environments, in as much as they make a connection between learning situations that are isolated, face-to-face or a combination of the two, require a redefinition of the organizing elements of learning in relation to: the agents involved (teachers, participants, administrative staff); the space where educational activities are held (home, education centre, computer laboratories, workplace); timetables; and learning sequences (Pérez, 2002). With respect to the role of the tutor, the following new skills and abilities are proposed: they must be prepared to generate effective dialogue both with participants and between participants, and in a manner that promotes active learning, the construction of cooperative, and/or collaborative knowledge.

The correct function of a virtual space that facilitates social interaction and the building of knowledge always require the intervention of a teacher/tutor who is able to direct the continuation and moderate the process. This permits the maintenance of live communication spaces, the facilitation of access to content and the animation of dialogue between participants which, in turn, helps tutors share their knowledge and as such build new knowledge. These professionals are fundamental to the existence of learning experiences and education formation that utilize CMC for

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[4] Original citation is: "un proceso interactivo y colectivo de producción de conocimiento en donde los alumnos producen el conocimiento activamente formulando las ideas por escrito que son compartidas y construidas a partir de las reacciones y respuestas de los demás".

collaboration (Cabero, 2001; Ryan et al, 2000; Salmon, 2000; Swan et al, 2000). Harasim et al (2000) and other researchers indicate that in the traditional mode of education and training, the teacher gives instruction, asks questions and controls the rhythm of class activity, where as in group learning, the process is centred on the student and requires that the teacher play a different role, something much closer to the assistant who is responsible for giving lesions. "The emphasis has to be in both the intellectual process of the student and in the learning that takes place in collaboration (Harasim et al, 2000, p. 198).[5]
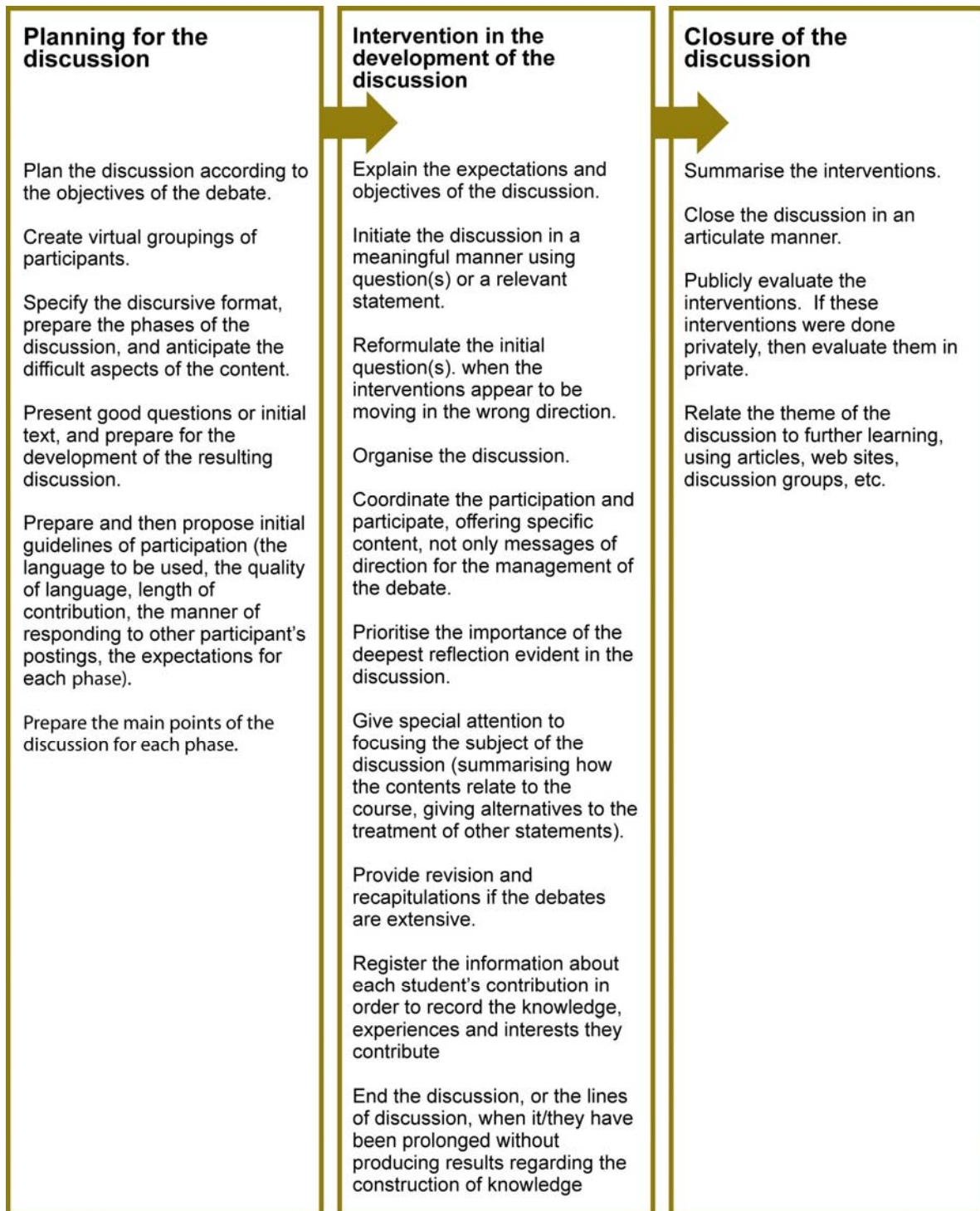
The moderation role of the teacher in virtual learning spaces

For both Paulsen and Mason the fundamental role for the moderator can be classified as falling within organisational, social and intellectual parameters (Mason, 1991, & Paulsen, 1995, cited in Cabero, 2001). The organisational aspect relates to the preparation of presentations, something that requires regular participation in the process (or, occasionally, the request that students direct discussions), the establishing of an agenda for the presentation, the determination of objectives for the discussion, the identification of the pathway of learning and the specification of the rules that will define the process. In the social aspect, creating a positive and friendly social atmosphere that is favourable for the development of a positive community learning environment is necessary. In the intellectual aspect, there is the need to focus on the fundamental points, and to recapitulate and evaluate the interventions.

We are in agreement with Ryan et al (2000), and various other authors, who concur on the characterisation of the roles and responsibilities given to the moderator in the breaking down of the presentation into the following four categories: pedagogical, social, administrative and technical. In the pedagogical category, the teacher is a facilitator who contributes specialised knowledge, who gives coherence to discussion and who synthesises the highlighted points that have emerged from discussion. In the social category, the teacher needs to have the ability to create an atmosphere of collaboration that permits the generation of a learning community. In the technical category, the teacher must guarantee that the participants feel comfortable with the software and must be capable of assisting them in this if necessary. In the administrative category, the teacher must know the software well enough in order to be capable of developing online sub-discussions, working groups, and to move and/or delete messages from the presentation.

One of the principal roles of the teacher is that of being moderator, in particular, during discussions. Barbera et al (2001) have synthesised the practices of the moderator in the development of discussion into three stages: planning, intervention in development and closing. These three stages and their associated exercises are presented in the following schema:

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[5] Original citation is: "el énfasis tiene que estar en el propio proceso intelectual del alumno y en el aprendizaje en colaboración".

Planning for the discussion	Intervention in the development of the discussion	Closure of the discussion
Plan the discussion according to the objectives of the debate.	Explain the expectations and objectives of the discussion.	Summarise the interventions.
Create virtual groupings of participants.	Initiate the discussion in a meaningful manner using question(s) or a relevant statement.	Close the discussion in an articulate manner.
Specify the discursive format, prepare the phases of the discussion, and anticipate the difficult aspects of the content.	Reformulate the initial question(s). when the interventions appear to be moving in the wrong direction.	Publicly evaluate the interventions. If these interventions were done privately, then evaluate them in private.
Present good questions or initial text, and prepare for the development of the resulting discussion.	Organise the discussion.	Relate the theme of the discussion to further learning, using articles, web sites, discussion groups, etc.
Prepare and then propose initial guidelines of participation (the language to be used, the quality of language, length of contribution, the manner of responding to other participant's postings, the expectations for each phase).	Coordinate the participation and participate, offering specific content, not only messages of direction for the management of the debate.	
Prepare the main points of the discussion for each phase.	Prioritise the importance of the deepest reflection evident in the discussion.	
	Give special attention to focusing the subject of the discussion (summarising how the contents relate to the course, giving alternatives to the treatment of other statements).	
	Provide revision and recapitulations if the debates are extensive.	
	Register the information about each student's contribution in order to record the knowledge, experiences and interests they contribute	
	End the discussion, or the lines of discussion, when it/they have been prolonged without producing results regarding the construction of knowledge	

In the first stage, the moderator prepares the discussion and the elements that might help him or her moderate it, which in turn indicates how to organise and facilitate the participants. In the second stage, when the discussion is facilitated, and the interchange and construction of knowledge is produced; the role of the moderator is that of building, to caution that the discussion should take a direction that agrees with the objectives designed, and to provide feedback on what has taken place. The third stage, which refers to the closure of the discussion, involves the summarising of the principal contributions, the acquisition of a consciousness of what the

process has involved and its accompanying knowledge construction. This is to say, the student teacher realises there is a form of personal knowledge construction that will be influential in the realisation of subsequent educational exercises.

Salmon (2000) has contributed a great deal to our comprehension of the role of the moderator, his or her qualities and skills. Based on current investigation, Salmon has established a model for the moderation of CMC. The model is presented in the form of a scale in which, on each level, appear two types of skills: the moderation of the virtual environment (e-moderating) and technical support. Also, it shows in the vertical bar, on the right hand side, the grade of interactivity during the development of the stages; which begins with very little activity in the access and motivation stage where they communicate with only one or two short messages. This communication increases slowly during the socialisation stage where they communicate more between each other and with more frequency. In the exchange of information and the construction of knowledge stages, this communication intensifies, producing the greatest amount of participation. In the development stage, communication decreases for reason that the character of the situation is more personal, meaning there is less communication between the participants. These stages demonstrate the interaction between competence and the effective factors that function in communication, such as growth in confidence, motivation and the group dynamic (Macdonald, 2003).

Salmon incorporates the concept of the e-moderator in order to refer us to the tutor who is specialized in moderation and e-moderating, for the purpose of referring us to the process of moderation of a discussion in a virtual environment.

- Access and motivation (Stage 1): In this stage, both for the moderator and the participants, it is essential to have access to the environment and to be able to acquire the skill to use CMC; aspects that are basic requirements for participation in the lecture. The first problem that the participants are confronted with is related to access to the Internet and the space where the lecture is conducted. Many need help in order to resolve technical problems related to the hardware, software, access to the Internet and on some occasions with access codes; help that it is important to be able to give online and by telephone. The moderator must be able to give this crucial support to participants.

- Socialization (Stage 2): It is in this stage that the participants establish their identities online and begin to interact. This creates and facilitates opportunities for socialisation but this will not occur without the existence of a meaningful and appropriate intervention on the part of the E-moderator. In this stage, the participants become accustomed to using the CMC to communicate with their colleagues, establishing a community of learning that enables them to feel that they are working together on common tasks.

- Sharing information (Stage 3): In this stage, the community begins to produce an interchange of information, the interactions of which as a result create an outcome where there are more participants who make contributions and with greater frequency, and who contribute information that is relevant to the work of others. As the information grows, it begins to accumulate in a disordered manner as a result of received information saturating the communication structure. The participants develop diverse strategies in order to cope with the overload of information and the time taken to manage it: they avoid

trying to read things too thoroughly, reading only that which interests them; trying to read everything and only going back when it is opportune and, finally; reading everything but seldom responding. The e-moderator needs to look at these strategies and to offer help and direction to the participants. The participants, who manage to organise themselves and learn to rapidly share large volumes of information in a team better master the problems associated with this stage.

- Construction of knowledge (Stage 4): In this stage, the group begins to relate through discussion rather than communicating through sending and receiving information (as in stage 3), and becomes active in the construction of knowledge. During this stage, the participants begin to interact with others in a more participative form, formulating and writing down ideas that articulate their understanding of the information content. This produces a better interaction because they read the messages of others and respond. It also frequently produces a beneficial dialogue where many participants manage to generate learning activities, extending their points of view and appreciating the perspectives of others.

- Development (Stage 5): In this stage, the participants search for further avenues through which they might achieve personal goals where they will be able to explore integrating CMC in both other forms and processes of learning. The participants become more critical of the technological environment that supports the function of CMC. For example, they become critical of the performance of the teacher, something that can make negotiation difficult in some instances. This is a stage where the construction of individual knowledge permits participants to explore their own thoughts and the processes of knowledge construction, not only in the area of the topics studied but especially through interactions with the moderator and colleagues.

Teacher skills and qualities

The moderators need to work with a series of skills and qualities that permit them to fulfil their role. "They need special skills to prepare and present a program that is both truly interactive and participative and, in this way, they need to facilitate and manage participation" (Moore, 2001).[6] These skills and qualities need to be presented in the four areas that are previously described: pedagogical, social, technical and administrative.

In the pedagogical area, the teacher (tutor) accompanies the student in their process of formation, mediating when necessary and providing feedback. Furthermore the teacher directs both individual and group learning, providing orientation and advice when the individual or group needs it. In the social area, the teacher must possess the social skills that permit the possibility of both creating and maintaining a learning community. The atmosphere in this learning community must be positive, welcoming and empathetic, and must always involve a predisposition to help. In the technical area, the teacher must possess a minimum skill level of a general character in relation to the use of technology, computers and networks. Furthermore, the teacher will need to have the technical skills that would facilitate participation in communication via online discussions. In the administrative area, the

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[6] Original citation is: "Se necesitan unas habilidades especiales para preparar y presentar un programa de estudios interactivo y participativo de verdad, así como para facilitar y gestionar la participación".

teacher will need to be skilled in the use of administrative tools that will provide the appropriate atmosphere for this project, meaning they will be able to both create and manage online discussions. This should involve facilitating the continuation of individual and group participation, and the administration of working groups.

With respect to the question of moderation, Salmon (2000) defines the skills and characteristics of the e-moderator in the following table. Moderation requires the need to make a connection between skills and characteristics, associated with certain personal qualities that permit the teacher to be adequately prepared to fulfil his or her role as a moderator.

Quality/ Characteristic	Safety	Building	Development	Facilitator	Knowledge sharing	Creativity
Understanding of online processes	Secure provision of a focus for the discussion, judge the interest of the participants, and test the different approaches while modeling how things should be done.	Capacity to build confidence and propose a line of development, to know who is online and what they are doing.	The ability to develop and enable others, to act as a catalyst, to sustain discussion, to resume, reiterate and to challenge, to be the monitor in moments of both comprehension and in error, to give feedback.	To know when to control groups, when to permit them to move on, to know how to get on with them, including with the non participants, to know how to steer a discussion and to effectively use time.	Capacity to explore ideas, develop discussions, promote valuable lines of enquiry, close unproductive lines of enquiry, select when to save knowledge, construct a learning community.	Capacity to use a range of CMC, from constructed activities to the free generation of discussions, to evaluate the success of a discussion.
Technical abilities	Understanding of the level of the student's level of ability to access and engage with the software.	Capacity to appreciate the basic structures of CMC, websites and the potential of the Internet for learning.	Knowledge of how to use the special characteristics of software, when, for example, the e-moderator must manage files.	Capacity to use the software according to its characteristics in order to explore how the users would for example: manage message histories.	Capacity to create connections between CMC and other elements of the learning program.	Capacity to use the software facilities in order to create and manipulate discussions and in order to generate a learning environment online.
Online communication abilities	To be polite, educated and respectful when writing communications online.	Capacity to write concise, energetic and attractive messages online.	Capacity to compromise when working online with people (although not with the hardware or software)	Capacity to interact using email and discussions, facilitating an interaction between others.	Sensitivity to the diversity of cultural sensibility.	Capacity to communicate well without the need of a visual signal.
Expert Content	Knowing which knowledge it is important to share, and which knowledge should not be shared, and knowing how to share knowledge appropriately.	Capacity to enhance relevant contributions.	Capacity to activate debates that involve proposing new ideas and questioning existing ones.	Have authority to set norms for students in order that they participate and contribute to CMC.	To have an intimate knowledge of the availability of resources. (e.g. In the www) and to be able to direct participants to them.	Capacity to intensify discussion activity through the use of multi-media and electronic resources.

Personal Character-istics	Being secure as a moderator in the making of decisions and in motivation.	Capacity to establish an identity online as an e-moderator.	Capacity to adapt to new contexts of learning, methods, audiences and roles.	Demonstrate sensibility when relating and communicating online.	To show a positive attitude, commitment and enthusiasm in order to learn online.	To know how to create a learning community that is useful and appropriate.

The formation of teachers

The skills that teachers possess in the situation where they teach face-to-face, even though they may be excellent teachers, do not guarantee success when they have to work in virtual environments; "a good teacher in the face-to-face situation will not necessarily achieve the good results that a teacher in the virtual environment will be able to" (Moore, 2001).[7] The effective skills of a teacher in face-to-face class situations are insufficient when it comes to virtual environments (Salmon, 2000). The reason for this is that the teacher who teaches in the face-to-face setting no longer has use of the physical and vocal gestures; online learning involves written communication that must function without these gestures.

It is necessary for teachers to be trained in such a way that they become equipped with the necessary abilities to adequately fulfil their role in the moderation of the discussion. This formation should provide the teacher with the necessary abilities to adequately cope with the social, pedagogical, technical and administrative aspects of their job. This is especially important with respect to the pedagogical and social aspects. A moderator who desires to do their job well and, in particular, to be satisfied with their performance in enabling their students to learn, should be conscious of the relevance of preparing themselves well for this role. This entails evaluating the particulars, complexities and differences present in this form of teaching in relation to other forms of teaching and training.

The formation of the technical and administrative aspects can be acquired more easily in a couple of face-to-face workshops or in a distance learning course, which has the peculiarity of enlivening the work from the student's point of view. Furthermore, the two methods of formation can be combined. However, as already said, the pedagogical and social aspects are the most complicated. This period of training takes longer and involves a mixture of enabling and experience. Harasim et al (2000) proposes a model in which moderators of the future work with experienced moderators, slowly accumulating responsibilities, beginning with the most basic tasks and always working with administrative support and help in order that these future moderators advance towards the acquisition of a complex understanding of the function of discussion discussions.

At times, an aspect that focuses on the formation of teachers, in relation to the contents they will use when they work in the virtual environment, can be postponed until a later point. This is especially the case when the teacher has not participated in the generation of the course, something which regularly occurs when working with practices that comprise distance learning in which the pedagogical team develop an exercise that later allows them to avoid having to intervene in the work of students. If all has been done well in the first instance, the questions that arise will relate to the virtual

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[7] Original citation is: "no necesariamente un buen profesor en un entorno presencial, podrá tener buenos resultado como tutor en un ambiente virtual".

environment. The use of associated administrative aspects already entered into the course requires information of the course contents in order to guide the discussion and assist in knowledge building. At this point, it is very important for teachers to know the course contents, the activities proposed, the meaning of the discussion spaces, the intention of the work and the methodological strategies to be used while teaching in a virtual environment as this would all augur well for the building of knowledge in place of facilitating a mere transmission of knowledge. For example, Silva and Oteiza (2002) report on a teacher-training experience involving a distance learning course aimed at teachers of mathematics for secondary school; a course that uses the same platform and learning environment which they would later use as tutors. The experience led to the configuration of a learning community of tutors which led to the formation of a virtual campus. This programme for the formation of tutors looks at: the introduction of distance learning; a unit in the course in which they act as tutors; and the evaluation of learning in virtual environments.

Salmon (2000) proposes a capacitating model for tutors (E-moderators) that has five stages and follows the E-moderation model described earlier. These stages are: welcome, induction, teaching, knowledge building and development. Each stage ends with a discussion in which impressions and advancements are discussed. The purpose of the *welcome* stage is to make the apprentices aware that they will meet up in a virtual discussion in their training that will involve reading and sending messages. They should send a small description of themselves for the purpose of introducing themselves to the other participants. The *induction* stage allows the apprentices to acquaint themselves with the protocols, including how to communicate with the other participants through this medium, an exercise that also facilitates their acquisition of the skills necessary to use the software. The *teaching* stage concerns the sending and receiving of information in the sense that one is giving the apprentices training in how to open the discussion and how to later knit messages together. The *knowledge building* stage involves inviting and stimulating the apprentices to discuss how they should use the CMC with their own students. In the *development* stage, one explores the use of the web as a teaching tool, building the confidence of the participants through encouraging them to consider how they might incorporate web-resources into their own e-moderation. This model can be used as a form of scaffolding in the training and development of e-moderators (González & Salmon, 2002). The training is supported by an instructor who has knowledge particular to the learning of the moderation of a real discussion, something that is achieved by the peers or tutors who have already successfully completed their online training.

A strategy highlighted by various authors (see Harasim et al, 2000; Salmon, 2000) involves the creation of a learning community of tutors where the tutors share experiences, the problems they have and useful strategies, etc. In this manner, they will build knowledge in a collaborative manner that will in turn improve their work; all the while using the same strategies that they must develop with their students. Such a strategy allows for the creation of a team spirit amongst the tutors that will be pertinent to both the institution they work for and the programme in which they are working. This strategy also turns out to be useful in very large training programmes that might involve the simultaneous duplication of the same course supervised by a group of tutors. This situation permits the creation of a group of tutors who will share, for example: concerns, problems, successful strategies, and support from the team who created the course contents.

There exists a clear consensus that the teacher's performance – the teacher's ability to raise the level of learning – is one of the keys in the

setting up of any process of teaching that creates innovators. ICT can support the processes involved in the continual training of teachers through the use of virtual learning spaces. Creating formative analyses of interaction, collaboration and learning in the company of peers and with the support of a tutor develops an appropriately complex realisation of the necessary teacher performance. These formative analyses can be introduced from the time of an apprentice's initial training in a faculty of pedagogy and/or education and carried on to the more advanced level of training during the development of a tutor's professional life. Because teachers use these virtual spaces for training, they are able to learn the role that awaits the 'virtual professor' in the most direct manner: that of being able to incorporate this mode of learning into teaching practices.

The virtual training experiences of teachers allow these professionals to access online events normally designed for qualified pedagogical teams, providing them with both national and international coverage. At the same time, it allows the teachers to acquire new competencies and skills that will enable them to face this new experience in the best conditions possible. This type of education could be transformed in future into one of the main resources of education and teacher training. Various countries on all continents are investing in this modality. However, it is necessary to be conscious of the specific character of the teaching profession and to avoid the use of models used in other industries and professions (Grünberg, 2002). In this context, the role of the tutor acquires new interest in that the tutor is the 'virtual professor' of students rather than a professor who performs in face-to-face platforms.

Conclusion

Information and communication technologies are producing changes in the form in which we both teach and learn. We are referring here to both the form in which teachers and learners connect with new knowledge and the form in which the agents involved interact in the educational process. The nature of communication and its impact on distance learning, not to mention face-to-face interactions, are particularly relevant. These communicative spaces offer possibilities for collaboration and knowledge building in a learning community.

The communicative aspects of ICT and the factors that influence their success vary in their pedagogical potential. It is necessary to recognise that these elements, at the moment in which this instrument is incorporated in the instructive design of the virtual environment, do not imply that the incorporation of these spaces guarantees the interaction, the collaboration or the building of knowledge. In this respect, one must at least consider three aspects: the design of platform spaces, the tutor's moderation and the relevance of the subjects debated.

Thus far, the majority of innovative initiatives have been realised in a very isolated manner by enthusiastic teachers who have dedicated a lot of time and effort to introducing methodological and technological modifications. This work of labour is not always contagious and the solitary activity of the innovator ends up being exhausting. For this reason, innovation, in the form of testing of technology, cannot be the sole responsibility of just a few teachers. There would need to be greater leadership on the part of an institution's academic team, meaning the inclusion of the technology cannot be something that depends solely upon the will of teachers. Rather, it must be an objective of the teaching staff to impact upon schools as a collective.

The generation of technological resources from the educational material to be found in the Internet necessarily involves innovative practices. A teaching model that centres on the student requires, on the part of the teacher, a greater variety of materials and, as such, he must work the Internet, using the resources that the Internet provides us with. It is essential that the formation of the teacher involves the acquisition of the necessary skills in order to adequately fulfil the role of moderating an online discussion. The tutor must have acquired these necessary abilities in order to adequately develop the social and pedagogical aspects of the discussion. An e-moderator who desires to do their work well must be conscious of the need to prepare well. Being prepared, in this context, requires valuing the particularities, complexities and differences related to the role of the e-moderator compared to other forms of teaching and education.

The technological links only have meaning if they exist within a social network. This is to say, if the school continues to remain isolated and neglect to incorporate technology into learning, education itself will be incompatible with our experience of the world at large. The development of networks supposes the existence of an evolutionary process in which innovation and learning should be central aspects. The real challenge is not only that students will have to learn via this approach but that schools themselves will have to approach education in this manner.

We consider it to be fundamental that the initial and on-going education of the teacher should incorporate in his or her plans and practice the required capacity to both design and teach in virtual learning environments.

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