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Presence in e-learning: Theoretical Model and Perspectives for Research

Annie Jézégou

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Abstract

This article proposes a model of presence in e-learning that is based on Garrison & Anderson's (2003) community of inquiry (COI) model. While the proposed model is similar to the COI model, there are some significant differences. It addresses the notion of presence from a different angle, and characterizes and specifies it differently. The article outlines the epistemological referents of the model proposed and describes the interaction processes at work in each of the three dimensions of the model: socio-cognitive presence (1), socio-affective presence (2) and pedagogical presence (3). The article concludes by outlining the theoretical and empirical research that is needed to confirm the relevance of the model proposed and to identify its strengths and weaknesses.

Résumé

L'auteure de cet article propose un modèle de la présence en *e-learning*. Ce modèle comporte quelques similitudes avec le modèle de *community of inquiry* en *e-learning* (Garrison et Anderson, 2003) mais également des différences importantes. En effet, il aborde la notion de présence sous un autre angle, la caractérise et la décline différemment. L'auteure précise tout d'abord les référents épistémologiques du modèle proposé. Ensuite, elle décrit les processus interactionnels à l'œuvre dans chacune des trois dimensions du modèle : la présence socio-cognitive (1), la présence socio-affective (2) et la présence pédagogique (3). Elle propose également une représentation schématique de ce modèle. Puis, elle montre la manière dont ses trois dimensions peuvent s'articuler et formule les principales hypothèses qui résultent de ces articulations. Pour terminer, l'auteure précise notamment que ce modèle doit être soumis à l'épreuve de réflexions théoriques et de travaux empiriques afin de confirmer sa pertinence, déterminer ses forces et lui apporter, si nécessaire, des axes d'amélioration.

Introduction

In an earlier article, Jézégou (2010a) presented a critical analysis of the Community of Inquiry model in e-learning (Garrison & Anderson, 2003; Garrison & Arbaugh, 2007; Garrison, Anderson & Archer, 2010), discussing the strengths and weaknesses of this model. The author outlined that one of the model's main strengths is that it provides a way to heuristically stimulate research on e-learning. Indeed, this model emphasizes the notion of presence in e-learning while separating it into three dimensions: cognitive presence, social presence and educative presence.

The primary weakness of this model relates to the hypothesis that presence promotes deep and meaningful learning outcomes. Rourke and Kanuka's (2009) review of the empirical research over the last decade suggests this hypothesis has not been verified. These difficulties originate from the fact that the authors of the Community of Inquiry model in e-learning do not make explicit the epistemological frameworks to which they refer, namely the philosophy of pragmatism and socio-constructivism.

Jézégou (2010a) attempted to answer Rourke and Kanuka's call (2009) for substantial research to strengthen the Community of Inquiry model in e-learning. She proposed several theoretical perspectives to substantiate the assumptions of the model. However, the following work did not pursue this direction: it moved away from this model to develop a new model of presence in e-learning (Jézégou, 2010b, 2012). This new model addresses the notion of presence in e-learning from a different angle and characterizes it differently.

This paper builds on this earlier work and presents the essential features of a model of presence in e-learning, especially its epistemological referents and its main dimensions, and how they are related. At the same time, it outlines the four main hypotheses resulting from this theoretical model.

1. The two epistemological referents of the model proposed

The model of presence in e-learning (Jézégou, 2012) supports the principle that certain forms of social interaction among learners—but also between the trainer and the learners—can create presence in the digital space of e-learning, when the learners are engaged in distance collaboration. This presence, in turn, fosters the emergence and the development of an online Community of Inquiry and, therefore, the individual and collective construction of knowledge. This model is limited to forms of verbal interactions supported by synchronous and asynchronous tools of communication without, of course, the body language being perceived.

The Community of Inquiry model in e-learning also supports this principle. However, the epistemological anchors of the two models share some common features while differing in others. Effectively, the new model of presence in e-learning places greater emphasis on the notion of transaction, derived from the philosophy of pragmatism of Dewey (Dewey, 1938; Dewey & Bentley, 1949). Unlike the Community of Inquiry model, the new model is affiliated with a socio-constructivist perspective supported by French speaking research on social psychology of cognitive development (Bourgeois & Nizet, 1997; Darmon, Butera & Mugny, 2008; Doise & Mugny, 1981; Monteil, 1987; Perret-Clermont & Nicolet, 2002;). This research has developed the theory of socio-cognitive conflict which, since the eighties, has been central to this perspective.

Both the transactional perspective of pragmatism and the theory of socio-cognitive conflict share a focus on the notion of "contradictory" collaboration (Baudrit, 2008; Damon & Phelps, 1989; Jézégou, 2010b, 2012). This notion is at the heart of the new model of presence in e-learning.

1.1. Two referents supporting the concept of "contradictory" collaboration

In its broadest sense, collaboration is characterized by the equal status of group members, their participation in social interactions and their working together on a jointly defined set of activities to solve a shared problem (Dillenbourg, Poirier & Carles, 2003; Henri & Lundgren - Cayrol, 2003; Jézégou, 2010b).

More specifically, "contradictory" collaboration emphasizes the positive role played by the expression of diverging opinions and the confrontation of points of view on learning (Baudrit, 2008; Damon & Phelps, 1989;). This position is supported by the socio-cognitive conflict theory. There is another approach to collaboration: "constructive" collaboration, which is described by Damon and Phelps (1989). This view is supported by the socio-constructivist stream of cultural psychology developed in England by Brown, Campione and Gardner (1995). It holds that individuals are able to solve a shared problem and construct new knowledge essentially through dialogue within a group by sharing their knowledge, in addition to coordinating their actions.

Native to North America, the transactional perspective of pragmatism (Dewey & Bentley, 1949) also supports the concept of "contradictory" collaboration (Jézégou, 2010b). This perspective insists first on the fact that collaboration is the main driver that allows a group of people to build a community of inquiry to resolve a problematic situation. This may be through expressing a doubt about a given topic, reacting to an unexpected event or by completing a project. This transactional perspective then emphasizes the communicative aspects of

action and the processes of generating creative solutions to a problem posed by a situation. According to Dewey (1938), inquiry practice is the best way to clarify the situation, to solve the problem and to justify the solutions. This practice can be considered a scientific process where the results are generated in an "experimental" manner as assumptions that can be revised through experience and deliberation.

It encourages transactions between actors or "investigators." According to the pragmatism of Dewey, transactions are social interactions that include confrontations between different points of view, mutual adjustments, negotiations, and deliberations (Dewey & Bentley, 1949; Delledalle, 1998; Favre, 2006). Finally, from this perspective, such transactions generate complex intellectual activity, one of whose outcomes is, according to Dewey and Bentley (1949), the construction of knowledge.

Complementary to the ideas of these authors, the French speaking research on social psychology of cognitive development sheds important light on the effects of contradictory collaboration on learning. This light results from the research on the theory of socio-cognitive conflict (Bourgeois & Nizet, 1997; Darnon, Butera & Mugny, 2008; Doise & Mugny, 1981; Monteil, 1987; Perret-Clermont, 1979; Perret-Clermont & Nicolet, 2002).

1.2. The effects of contradictory collaboration on learning

The theory of socio-cognitive conflict supports the principle that it is through this form of collaboration with others that a person learns. According to this approach, contradictory collaboration is based on social interactions of confrontations of divergent points of view, exchanges, common ground and negotiations that challenge the individual and stimulate further learning as collective activity is completed. Here, the socio-cognitive conflict theory shows the roles played by confrontation of divergent points of view in cognitive development (Bourgeois & Nizet, 1997; Darnon, Butera & Mugny, 2008; Monteil, 1987; Perret-Clermont & Nicolet, 2002). The theory emphasizes the need for disagreement between divergent views (conflict) and that this disagreement must be overcome to reach a new communal resolution, in which none of the original points of view should be imposed or abandoned. Instead, all points of view must be used to solve the problem. During this confrontation, an inter-individual imbalance appears in the group as each person is faced with divergent views and, thus, becomes aware of his or her own thinking as being distinct from that of others. Individuals realize that their position is not necessarily the only one possible (cognitive decentration), causing them a second intra-individual imbalance that forces them to simultaneously reconsider their own mental constructs and those of others in order to build new knowledge. This constitutes cognitive progress if the resolution of the conflict caused by the double mismatch allows participants to acquire or develop new cognitive or social skills. Thus, this theory can partly explain the effects of contradictory collaboration on the individual construction of knowledge. However, this only partly explains the notion because it is not based solely on the confrontation of divergent views (conflict); it is also based on other forms of transactions, including mutual adjustments, negotiations or deliberations (Baudrit, 2008; Damon & Phelps, 1989; Dewey & Bentley, 1949).

Additionally, the theory of socio-cognitive conflict and the transactional perspective of pragmatism also agree that contradictory collaboration promotes learning at the group level. The group constructs a collective experience that enables it to reach a goal of solving a problem linked to the formalization and implementation of solutions. This experiment requires the group to define the modalities and functioning of collaboration and adopt a problem-solving approach. This approach also leads the group to test the results and evaluate them. Such an approach is essentially formative; indeed, it invites the group to carry out interim assessments, to establish means of control of the activities to be undertaken and to build a collective product. This approach also provides a return on the experience received, to extract from it the elements of collective satisfaction, and to gain satisfaction from the demands and constraints of the collaboration.

Thus, these two epistemological referents together support the idea that the social interactions of conflict, negotiation and deliberation play an essential role in constructing individual and collective knowledge. In other words, the transactions between group members undertaken to solve common and joint problematic situations are essential to constructing knowledge. Building on this common position, the three-dimensions of a model of presence in e-learning can be seen from a theoretical point of view: (1) socio-cognitive, (2) socio-affective and (3) pedagogical presence.

2. A three-dimensional model of presence in e-learning

As mentioned above, the model of presence in e-learning takes as its starting point that certain forms of social interactions among learners, but also between trainer and learners, can create presence in the digital space of communication, when learners are engaged in distance collaboration. This presence, in turn, fosters the emergence and the development of an online community of inquiry and, therefore, the individual and collective construction of knowledge (Jézégou, 2010b, 2012).

However, this position does not say anything about the interaction processes at work in the presence of e-learning. At the very least, it specifies that these processes refer to particular forms of social interactions. To identify and characterize these processes, two general principles of modeling work was applied (Bressoux, 2008; Chevalier & Guyonnet, 2006; Passeron, 2000). The first is that any phenomenon, including presence in e-learning, consists of incoming elements upon which one can act in order to influence the outgoing elements. The second principle is that such modeling only refers to situations where the incoming and outgoing elements are known. Modeling should not be confused with simulation (where the incoming elements and the phenomenon are known) or with command (in which of the outgoing elements and the phenomenon are known). Such modeling work thus consists of describing the processes that constitute the phenomenon.

In the phenomenon of presence in e-learning, the two known incoming elements are a group of learners must solve, in e-learning, a problematic situation (1) and a trainer of an e-learning course (2). The known outgoing element is an online community of inquiry.

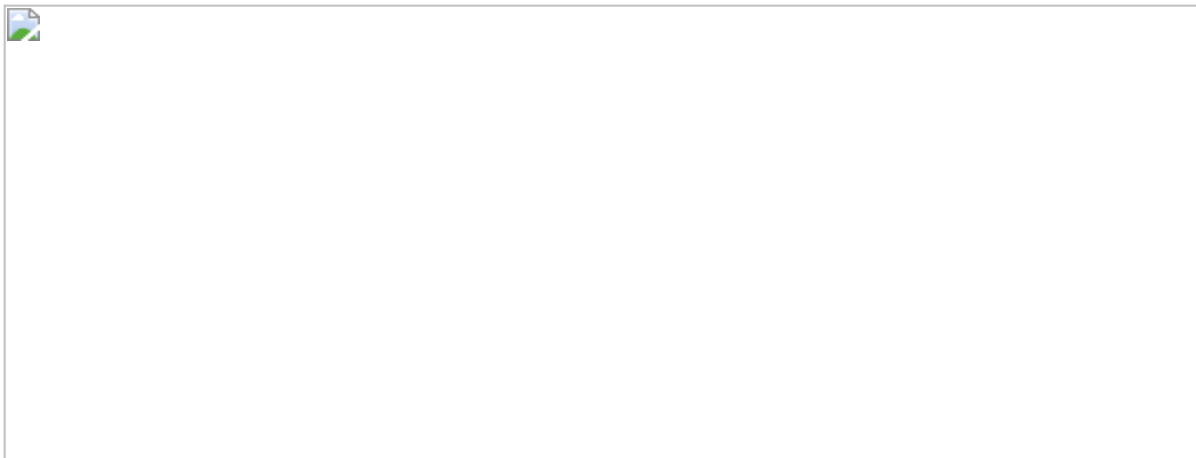


Figure 1. General outline of modeling presence in e-learning (Jézégou, 2012)

The objective of the modeling was to identify the interaction processes at work in the presence of e-learning and the key dimensions that characterize it.

There are three dimensions: socio-cognitive presence (1), socio-affective presence (2) and pedagogical presence (3). The following sections describe what precisely is meant by each aspect of the three-dimensional model of presence, before providing a schematic representation. They also present how these three dimensions can be related to one another and the main hypotheses resulting from these relations.

2.1. Socio-cognitive presence

Socio-cognitive presence in e-learning results from transactions between geographically distant learners who come together to solve a problem using synchronous and/or asynchronous internet communication tools (Jézégou, 2010b). The grouping may be spontaneous or set up by the trainer. Transactions among learners of the group manifest themselves in jointly led activities and in a common method in the practice of inquiry (Dewey &

Bentley 1949). This practice of inquiry unfolds in four distinct stages (Dewey, 1938): (1) definition of the problem; (2) creation of a hypothesis to solve the problem; (3) testing of this hypothesis and (4) a conclusion. Thus, the practice of inquiry stems from an incompletely defined situation containing aspects that are confusing, unexpected or unusual.

It begins with a working definition of the problem posed by the situation. The situation is then analyzed and observed to extract and define the problem and to understand the specific character or causes of this problem. The second stage of the practice of inquiry is to formulate hypothetical actions to solve the problem. Then, by comparing these hypotheses, the goal is to determine which one can give the most satisfactory solution to the problem while taking into account the complexities of the situation. The third step is to test the hypothesis to see if it offers an effective solution to the problem. Finally, the fourth and final step is the conclusion, which aims to assess the practical consequences of testing or the results obtained to conduct a critical analysis of the three previous stages of the investigation. The conclusion also redefines the situation or communicates the results of the completed investigation in a mutual and transparent way.

When learners come together to solve a problem, each of the four phases of the practice of inquiry requires transactions between learners (Dewey & Bentley, 1949). Learners express their differences, their similarities and their distinct points of view. They then collectively adjust, negotiate and interact with one another to define the problem, create possible solutions, choose and test a solution and then finally formulate a conclusion on the results of the experiment. Such transactions show that they are engaged in contradictory collaboration. In the context of e-learning, these interactions generate socio-cognitive presence in the digital space of communication despite the geographical distance between learners.

Given these factors, socio-cognitive presence is characterized as follows: “socio-cognitive presence in e-learning results from existing transactions between learners to jointly solve a shared problematic situation. Transactions are social interactions of divergent points of view, mutual adjustments, negotiations and deliberations. This socio-cognitive presence, in turn, contributes to the emergence and development of an online community of inquiry” (Jézégou, 2012).

The processes at work in socio-cognitive presence can be formalized more specifically as follows:

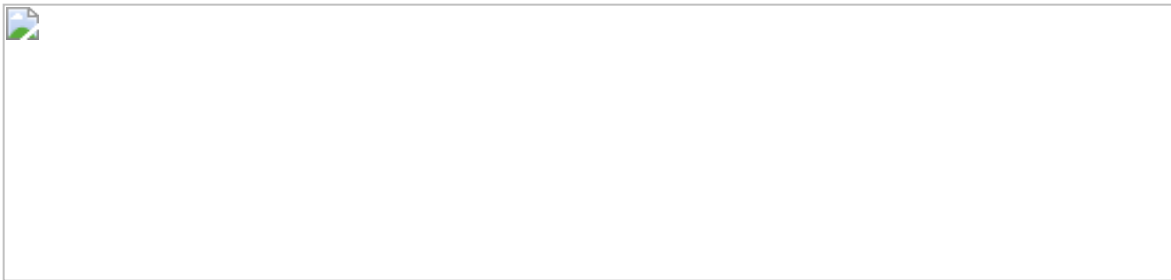


Figure 2. Modeling of socio-cognitive presence in e-learning (Jézégou, 2012)

Such a socio-cognitive presence has a greater impact on learning through transaction when conveyed by asynchronous verbal communication. Asynchrony in distance collaboration offers many advantages over the transient nature of communication in real time (Henri & Lundgren-Cayrol, 2003; Garrison & Anderson, 2003). In addition to the fact that communication can be recorded and is, therefore, available at any time to the learners, asynchronous communication has a fundamental advantage for learning: it creates temporal conditions that favor reflection. Indeed, the asynchronies in distance collaboration provide an opportunity for each group of learners to identify, clarify and record prior knowledge and then to explain these ideas in writing in order to make them available to others. In addition, this kind of communication provides time to adopt a broader cognitive perspective, where each becomes aware that their position and arguments are not the only ones possible, reconsidering their representations and patterns of action to build new knowledge. Temporal flexibility for the implementation of all of these processes allows for reflection, a fundamental necessity for successful learning.

2.2. Socio-affective presence

The transactional perspective of pragmatism (Dewey & Bentley, 1949) emphasizes the importance of the socio-affective climate in which transactions take place during the practice of inquiry. Mutual respect is necessary for confrontation resulting from divergent points of view, and for negotiation and deliberation to be effective in resolving shared problems (Dewey & Bentley, 1949).

This perspective is also supported by the theory of socio-cognitive conflict which stresses that the enlargement of cognitive perspective is facilitated when learners perceive the confrontation of their views as constructive for themselves and for others. This type of thinking is difficult when the learners perceive disagreement as a personal attack. Thus, the resolution of socio-cognitive conflict is enhanced by an egalitarian climate that is relaxed, amicable, polite, caring and respectful of others rather than a climate of discord and aggression (Monteil, 1987; Bourgeois & Nizet, 1997). More specifically, socio-cognitive conflict is much easier to solve if it unfolds in an atmosphere based on a relationship that is socially symmetrical and friendly (Monteil, 1987). This should be based on a context of contradiction, mutual adjustment and deliberation and therefore on the existing transactions between learners (Dewey & Bentley, 1949). The degree of symmetry of the social relationship is primarily based on the degree of equality in socio-professional status, age or level of expertise (Bourgeois & Nizet, 1997).

These differences in characteristics between the individuals engaged in the interaction can be objectively stated or may be subjective, formed by the impression that each party gains of the other. A highly asymmetrical relationship tends to lead to social and non-cognitive resolutions of conflict, either by convenience (a viewpoint is held for the benefit of another) or by juxtaposition (each keeps their own point of view); such non-cognitive resolutions tend to undermine any possibility of learning. Thus, it is important for the partners involved in an interaction to reduce this asymmetry of perceived differences by creating a climate of equality. As for the climate of friendship, this refers to the emotional aspects of social interaction between peers (Monteil, 1987). Being attentive to others, expressing disagreement without aggression, being empathetic, encouraging and helpful are all aspects that facilitate the development of a dynamic collaboration at a distance (Charlier, Deschryver & Daele, 2002; Dillenbourg, Poirier & Carles, 2003; Henri & Lundgren-Cayrol, 2003).

Given all these factors, socio-affective presence is characterized as follows : “socio-affective presence in e-learning is generated by symmetrical and amiable social interactions between learners. These interactions create a climate that can encourage transactions within the digital space of communication. This socio-affective presence, in turn, contributes to the emergence and development of an online community of inquiry” (Jézégou, 2012).

The processes at work in socio-affective presence can be formalized more specifically as follows:

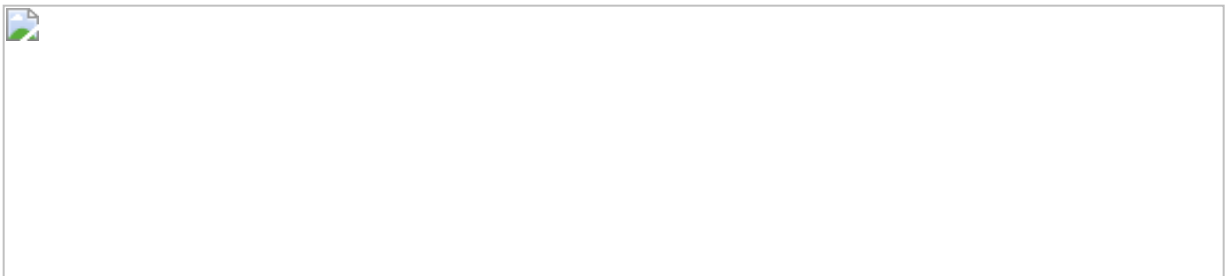


Figure 3. Modeling socio-affective presence in e-learning (Jézégou, 2012)

This socio-affective presence can support socio-cognitive presence. However, it is quite possible for symmetrical and amiable interactions to develop (socio-affective presence) without any of the transactions that are necessary to solve a problematic situation for inquiry taking place. In other words, socio-affective presence may be observed in the digital space of communication even though effective socio-cognitive presence is absent. Socio-affective presence is thus an entirely separate phenomenon: it has its own processes of symmetrical and amiable interactions between the learners.

2.3. Pedagogical presence

For many learners, "distance collaboration" is not a natural or automatic process. "Collaborative knowledge" involves learning to acquire meta-cognitive abilities and social skills required for collaboration (Bourgeois & Nizet, 1997; Darmon, Butera & Mugny, 2008). The trainer can help learners acquire these abilities and skills by playing the role of "facilitator" through his interactions with the learners (Henri & Lundgren-Cayrol, 2003; Deale, 2006; Jézégou, 2010b).

This role of facilitator is to be: (1) coordinator, (2) "animateur" and (3) moderator. As coordinator, the trainer advises the group to define a common framework, despite geographical distance, and to organize the necessary activities, while encouraging exchanges between learners in the group. At the same time, the facilitator must be careful not to impose rules that are too formal or rigid. The working arrangements that govern these transactions between learners are important in providing good conditions for the resolution of socio-cognitive conflict. As "animateur", the trainer encourages transactions between learners at all stages of the practice of inquiry. He or she also provides support, especially when the group is having its first experience of distance collaboration and is unused to developing and implementing a practical inquiry. As moderator, the trainer regulates, if necessary, how learners function at a distance. For example, trainers may try to temper strong judgments and reactions. The purpose of this moderation is to avoid tensions and ensure that the educational climate is egalitarian and amiable.

Given all these factors, pedagogical presence is characterized as follows: "pedagogical presence in e-learning results from the social interactions of coordination, "animation" and moderation which the trainer maintains with learners. These interactions may promote transactions between learners while contributing to a socio-affective climate that is based on socially symmetrical and amiable relationships within the digital space of communication. This pedagogical presence, in turn, contributes to the emergence and development of an online community of inquiry" (Jézégou, 2012).

The processes at work in pedagogical presence can be formalized more specifically as follows:

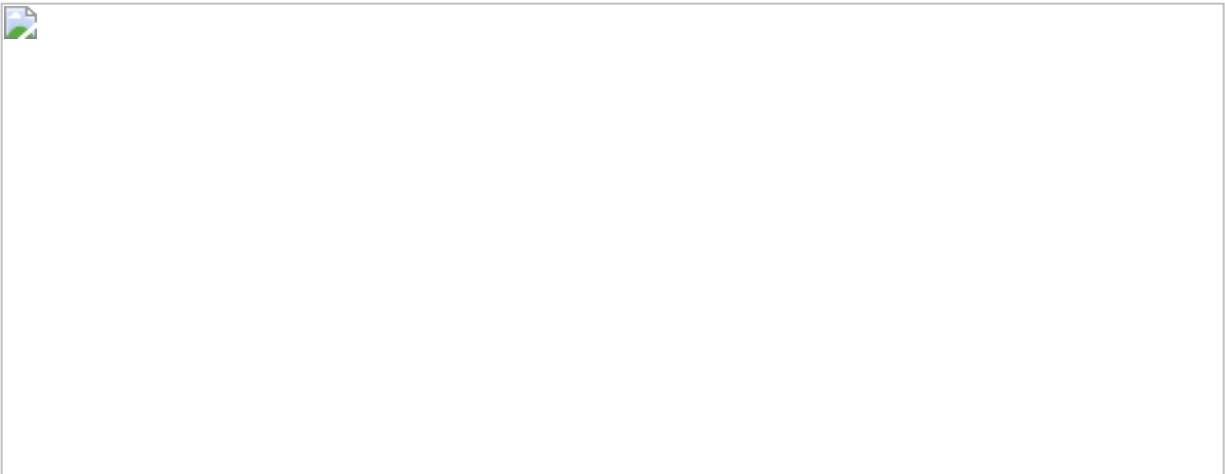


Figure 4. Modeling pedagogical presence in e-learning (Jézégou, 2012)

This third dimension of presence can support the other two dimensions. As with socio-affective presence, pedagogic presence can be expressed independently of socio-cognitive presence in the digital space of communication. Even the best efforts of the trainer to facilitate contradictory collaboration may fail if the learners prove unable to engage in the shared tasks required for resolution of a problematic situation. Without transactions between learners, a community of inquiry cannot be said to exist. Social interactions may occur which are not based on symmetrical relations and amicable exchanges.

Like socio-affective presence, pedagogical presence is an entirely separate phenomenon, with its own processes of social interactions of coordination, « animation » and moderation that the trainer conducts with the learners.

3. Schematic representations of the model and hypotheses

Presence in e-learning results from three processes of interaction as modeled previously. Each of these processes is associated with one of the three specific dimensions of presence. Each may be present independently of the two others, and contribute to the development of an online community of inquiry :



Figure 5: Figure 5. The model of presence in e-learning (Jézégou, 2012)

The following diagram is a three-dimensional presentation of this model, illustrating how as each dimension of presence increases, so does the overall or global level of presence:

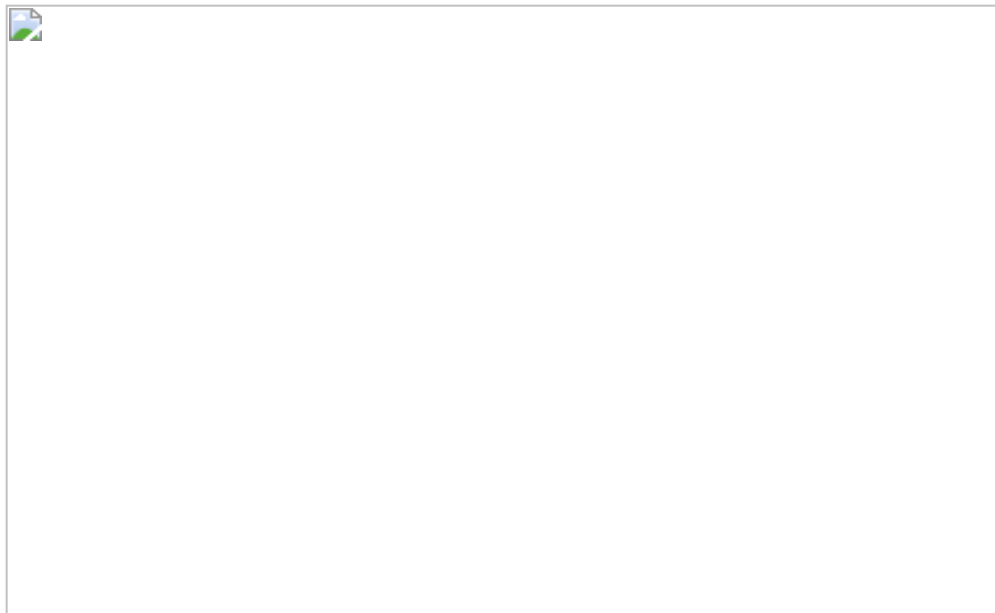


Figure 6. Three dimensional representation of presence in e-learning (Jézégou, 2010)

This proposed relationship between the interaction processes described here suggests the following hypothesis:

- The more that global presence increases, the more likely it is that an online community of inquiry will be fostered, and therefore that the individual and collective construction of knowledge will occur.

In addition, the possible interactions of effects between the dimensions of presence suggest two further hypotheses:

- that when the degree of socio-affective presence is increased, then the degree of socio-cognitive presence will also be increased
- that when the degree of pedagogic presence is increased, then the degree of socio-affective will also be increased.

Conclusion

This article has articulated a new model of presence in e-learning, including its epistemological referents, its three main dimensions and how they can be related to one another. It also outlines four main hypotheses resulting from these relations.

Any such model is by definition temporary, reductive and imperfect (Passeron, 2000 ; Chevalier et Guyonet, 2006 ; Bressoux, 2008). On one hand, it strives to capture the relevant characteristics necessary to understand a complex phenomenon. Therefore, it meets the requirement for parsimony: it is a simplification of reality. On the other hand, it needs to be sufficiently detailed to enable critique by other researchers in the field and to be tested empirically.

Empirical research is needed to confirm its relevance, and identify its strengths and weaknesses. This empirical research will help to refine and verify the resulting hypotheses. For testing these hypotheses, a matrix of indicators of presence will be constructed and a protocol for assessing the level of presence existing within an environment of e-learning will be developed. This development process will involve several French speaking researchers in the field and the resulting tool will be described in a future paper.

However, this model already has a sufficiently robust epistemological basis to help researchers as they develop their thought on the notion of presence in e-learning. The model thus provides another heuristic framework for stimulating research on e-learning.

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