Complex Learning

A way for rethinking Pedagogies and Processes in Technology-Enhanced learning and Education

Laura Vettraino (Author)
Learning Community srl
Rome, Italy
e-mail: vettraino@learningcom.it

Eleonora Guglielman (Author)
Learning Community srl
Rome, Italy
e-mail: guglielman@learningcom.it

Marco Guspini (Author)
educommunity – Educational Community
Rome, Italy
info@educommunity.it

Valentina Castello (Author)
Università degli studi dell’Aquila
L’Aquila, Italy
valecastello@yahoo.com

Abstract — Rethinking Pedagogy and learning processes: that is necessary since WEB 2.0 modifies the learning environments, make educational experiences more complex and enrich learning strategies. Nevertheless pedagogic theories and didactic approaches, inherited by the consolidated “face to face” teaching, continue to be applied to the net-learning, still using conceptual categories like: virtual classrooms, e-books, e-tutor, e-contents, learning objects, interactive blackboards, evaluation tests. That is, probably, the reason why web 2.0 and e-learning 2.0 often do not work and are ineffective even if they represent the vanguard of web mediated learning. The present paper proposes Complex Learning as a possible theoretical key of analysis fit with the changed scenarios, able to show a way to meet the challenge of rethinking Pedagogies and learning processes.

Rethinking Pedagogies and Processes in technology enhanced Learning; Technology enhanced Science Education; Social Computing for Learning and Knowledge Sharing.

I. INTRODUCTION

Rethinking Pedagogy and learning processes: that is necessary since WEB 2.0, e-learning 2.0 and social networking modify the learning environments, make educational experiences more complex and enrich learning strategies. Nevertheless pedagogic theories and didactic approaches, inherited by the consolidated “face to face” teaching, continue to be applied to the net-learning, using conceptual categories like, for example: virtual classrooms, e-books, learning units, e-tutor, e-contents, learning objects, interactive blackboards, evaluation tests. That is, probably, the reason why web 2.0 and e-learning 2.0 often do not work and are ineffective even if they represent the vanguard of web mediated learning.

The paradigms of "face to face" teaching, widely applied to the web, can only limitedly explicate the web mediated learning process and, consequently, they allow only in part to support and animate them satisfactorily.

Some courage and an open attitude, oriented to change, are necessary in order to take advantage from the technology enhanced learning environments. Indeed in the web mediated learning environments there is something that cannot be reduced to the “face to face” learning spaces and experiences.

If we really want to rethink Pedagogy and identify a new possible interpretative key of complex technology enhanced learning experiences, it is necessary to identify and focus on the specificity of web mediated learning processes. Consequently, it will be possible to find effective approaches.

II. WHAT COMPLEX LEARNING IS NOT

In order to understand the efficacy of Complex Learning, as a rethought Pedagogy, it is necessary to understand how learning processes are rethought too.

The main way, in order to understand this required cultural and practical change, is to explain what is not Complex Learning. Complex Learning is not a structured course with predefined trainers, learning classrooms, contents, modules, units, evaluation sessions; it is not the negation of known and usual teaching and learning processes; it is not a group work, a cooperative work, a project work; it is not an individual experience of learning; it is not a spontaneous process.

III. WHAT COMPLEX LEARNING IS


The term “complex” explains the complexity of the dynamics that happen thanks to the added value represented by the re-configuration among the different typologies of learning models, new links and new hierarchies among media, new languages and new interaction way, therefore “remediation” [7].

In Complex Learning the objects look no more closed and self-referential, but they bring the sign of the transformations they sustain by virtue of the interaction with and among the subjects who change and build them and no more only enjoy them.
The subjects’ role changes, it’s not fixed once and for all: everyone can express his competence and his tutorship in relation to the field he/she has an expertise. The participation to this process by all people taking part in the dialogue space leads to go beyond the course enclosure, putting the learning experience in a multiplicity of concrete and virtual places, inhabited places, that become real places.

A Complex Learning Community grows in this multi-dimensional environment, where the learning process reflects the complexity of real world and the social relations that take place in it: multiple interactions among people, technologies, purposes, environments where they move and act [8].

To better understand what Complex Learning means it is necessary to answer a key question: "how learning approaches change when plunged in the web?" or better "how learning approaches change when plunged in the network of, human and technologic, formal and informal, real and virtual interconnections empowered by the web?" Four case studies offered a practical way in order to answer these questions:

- TRAMPI - National Training Centre of MIUR a web community aimed to train at a distance 11.000 people in charge for the accounting in the public school (2001)[9];
- COMUNET - Community network of Third Sector's operators (2006) [10];
- INDIRE PuntoEdu a national Community of public school teachers aimed to improve the development and implementation of technological didactic solutions (2008) [11];
- DEEPER Community an European web community of operators dealing with refugees and asylum seekers (2011) [12].

Learning behaviors have been analyzed through a general observation, in two of the cited experiences, and in the others two they have been analyzed through a systematic observation, supported by the collection of quantitative data and statistical analysis.

A large sample of messages (at least 4.000 messages) was analyzed; interactions have been observed for a period of at least one year to three years; data have been extracted from databases of asynchronous learning network interactions and have been recorded so that whenever they can be checked and revised.

In order to check the increasing of learning, the interactions have been categorized as verbal behaviors; sequential analysis [13] [14] was the adopted technique; conditional and transitional probability were calculated in order to find eventual operative connections among specific interactions in particular conditions and circumstances.

The analysis of the collected data shows some key items:

- a) general attitudes of participants;
- b) verbal behaviors generating learning interactions;
- c) steps of development of the learning community's interactions.

A. General attitudes of participants

In the analyzed interactions, learners tend to apply to web-mediated learning the learning routines consolidated in “face to face” learning experiences.

They tend to: reply a "one to one" pattern of communication instead of "many to many", addressing a message to a specific interlocutor; answer only questions directly addressed; state a point of view, in a single episode, without really searching interaction or coming into dialog.

A second and indicative behavior is the tendency to accept to actively interact when a synchronous virtual meeting is planned at a specific time and date with a specific invitation, instead of taking advantage of asynchronous opportunities of interaction.

The third tendency is to assume a passive position of lurking more then taking initiative, or when they take initiative, they search the interaction with the “Tutor”.

Finally, the expectation of ordinate and pre-ordinate learning contents, units, objects, can be highlighted among indicative general attitudes of participants.

This is normally the starting point. People usually adopt what is familiar and known in order to afford change: web-mediated learning environments and experiences indeed require a change. At this previous stage, verbal behaviors are static, generic and do not really add any knowledge to the interaction.

B. Verbal behaviors generating learning interactions:

Already at this starting stage, also meaningful verbal behaviors, indicative of learning interactions, have been identified.

These behaviors are: participants ask questions connected with daily work activities; a colleague gives an answer to a question connected with daily work activities; a personal experience is proposed as example of a possible solution; a participant asks for a clarification; a participant integrates the answer given by a colleague; participants share tools of work, participants identify experts "de facto" to refer to.

It is also possible to identify learning process in these verbal behaviors, if we intend learning as: the application of a knowledge to a different context, the creation of connections between contents or situations apparently divergent, the integration and completion of contents, the finding of practical solutions, the formulation of an hypothesis of work, the flexibility in assuming different points of view about the same problem, the adaptation of an existing tool or solution to a new problematic situation.

These particular verbal behaviors, then, can represent the master key for the activation of a collective productive dialog, generative of learning.

The initial general attitudes, previously described, actually tend to evolve from a sort of "collective monologue" towards an effective networking learning interaction.

C. Steps of development of the learning community’s interactions

Actually, the studied cases show roughly a common development scheme [15]. This development is at the same time sequential and reticular: the lifecycle of the learning...
group, during the line of the time, is sequential and follows progressive phases; yet the development of the relationship among the members of the Community is a reticular and not linear process.

One year is the basic time required in order to observe the beginning of typical dynamics:

- decreasing of oppositions and mistrust;
- consolidation of the sense of belonging and membership;
- happening of "cognitive dissonance"[16];
- establishing of a logic of reciprocity;
- growing of the disposability to share experiences and knowledge;
- development of peer to peer support dynamics.

Within two or three years the Community tends to consolidate these processes and to start up new dynamics such as:

- identification of experts "de facto";
- improvement of the autonomy of the community in the problem finding, problem setting, problem solving;
- developing of a dynamic leadership at a variable asset;
- growing of the networking with other (virtual or real) communities having similar interests and aims;
- flexible and integrated use of a rich mix of communication devices.

The first group of steps describes the development of a web community; the second group of steps describes more specifically the dynamics of a Complex Learning Community.

IV. Conclusions

The key question is how to support and encourage the development of the described steps. The implementation of a productive dialog, generative of learning, indeed, is not a spontaneous process; as well the culture of sharing, required by the "web" and "network" logic, is a result more than a starting point.

The animator of the Complex Learning Community represents a key for the start up of this process and for the success of the Complex Learning Model. If he/she acts effectively the Complex Learning Community acquires more awareness and sense of belonging, become more autonomous and able to choice new aims, to manage the work organization, also through the identification of experts "de facto". Then, the duration of the lifecycle of the Complex Learning Community is connected to the existence or the capacity to find new aims to be reached and common problems to be solved.

Nevertheless, to grant the success of Complex Learning Model, first of all it is necessary to change a consolidated mental attitudes about learning and about teaching, taking in mind the complexity of new hybrid, ubiquitous and liquid, learning scenarios [17] [18] [19]. In these changed scenarios, Complex Learning represents a possible theoretical key of analysis and a Pedagogic paradigm fit with this complexity and able to show how to meet this challenge.

REFERENCES