

For e-learning, also the « e » is important

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Abstract

Generally, ICT research in education gives a daily meaning to the training through the technology or amplifies the social discourse on socially constructed informal reality. Whatever option is chosen, the discourse on ICT gives foundation to the tools as training or learning outlines. e still are in the "learning" of the e-learning where the "e" becomes subordinate. However, the ICTs are not only a speech. They also are action upon the world. In this context, we already know the main role of intellectual and/or material tools in the structuration of knowledge.

Our communication presents a model in order to reach an ICT integration that passes beyond the instrumentation of pedagogical models. This model considers the ICT as a variety of devices produced by human activity and as means for establishing human relationships throughout contrasted situations. This model is based on the idea that tools participate to the improvement of cognitive skills, that tools are transforming themselves through the time and that they change back those skills. Defining mediation as an interaction amplified by the tool, its role is to give birth to an artefactual process that authorizes the construction of new knowledge and innovations. In this context, the ICT activities are mediated by the tools and by the tool sets which are elaborated by our customs.

This model offers a new option for analysing e-learning situations. It is based on the artefact concept as well as on the approach of objective knowledge based, itself, on the theory of the three worlds (Popper, 1994).

The artefact is defined as an effect of art and as a gradually elaborated construction during mediation to reach the "quasi-real" representations ready to be methodically dismantled as methodically as there were imagined in order to make no doubt to the user regarding the artefact.

Accordingly to the three worlds theory - the physical realities world, the experimental consciousness world and the objective knowledge world - the artefactual process of constructing knowledge puts us in contact with the objects through our experiences. Taking into account that these experiences are also lived into the symbolic world of representations, they are influenced by all the knowledge and the others representations we have. The passage between subjective knowledge (2nd world) and the objective knowledge (3rd world) is made by the modelisation of practices that becomes knowledge and that can be submitted to criticism and experimentation.

Keywords : word, artefact, knowledge, experience

1. The report

Nowadays, ICTs are more focused on practices than on theoretical models. They are a transversal knowledge based on practice and recognized by the outcome of various interdisciplinary fields of publication. They can be considered as actors of a paradigm based on experience who are involved in information society. Therefore, we are considering two options for thinking over ICTs. The first one gives a meaning to the real ICT formal: the technology. The second expands the social discourse on a socially constructed real informal: the information society. Whatever option is chosen, the ICT discourse is basing the tools on training or learning. In fact, we are in the « learning » of e-learning and the « e » becomes subordinate (Lebrun, 2008). On one hand, the arguments are « in accordance » with intrinsic sense of everyday life. In another hand, the arguments are « acceptable » by the here and now society. However, ICTs are not only a speech but also an action on the world. It is difficult to think over ICTs without taking into account the technique and the social involvements it results. How to consider ICTs thinking neither the tools through which teaching contents are produced or nor the tools through which knowledge is transmitted ? The choice made out of the tools creates situations that lead to new knowledge, modifying tools. In that way, the cognitive capacities adapt themselves to tools and to social practices to which they belong. Therefore, tools

are essential in any type of circumstances. How to forget the theoretical importance of tools in cognition ? How to forget that ICTs also call attention from the study of the technologies ?

2. The essential role of tools

ICTs are not only technical tools. They are technical, cognitive and culturale means. To use a browser on the Web requires as many technical skills as cognitive representation activity. The tool has got this kind of representation in the Internet user's mind. Therefore it is transforming mental processes, cognitive strategies of exploration and learning activity. Tools are not only ccessories in the human activity. They also transform it and amplify it (Vygotski , 1985 ; Tikhomirov, 1974). ICTs can be considered simultaneously as the product of a human activity as well as of social practices and of release mechanisms of an intellectual activity. They are also « crucibles » of the socially shared human knowledge at a certain aime (Norman, 1993 ; Lave, 1988). The interest of the ICT, used in situations of open and distance learning (ODL), lies in the various forms of representations which they can give and in actions which they can raise up. The tools facilitate the navigation between various graphical or calculatory representations and allow to weave links between the situations. In that way, students can increase their reflection on the activities they are leading. Eventually, about the « learning » itself, the main question remains to study the links which the pupils may make, considering the problems they are asking to themselves or considering the genesis state of the cognition. The techno-didactical difficulty is indeed located in the passage from the navigation between the situations proposed to the one between the underlain concepts.Regarding pupils, how to present and to connect various situations according to relationship network of the conceptual field ? According to the student's activity, what are the privileged links that he is going to weave ? If we consider that the instrumented situations have to reflect the abstract relations, the « e » becomes the intermediary between the conceptual field and the student's knowledge.

With an essential educational vision (Lebrun, 2008), the use of tools is made according to a linear progress in the course of which the pupil can reach a certain freedom at the navigation level. Indeed, the « e » ensures particularly its rôle: by leaving enough time to the slow student and enough motivation for keeping the attention of the most active one. This corresponds to the current educational models : the individualization, the autonomy and the motivation in the learnings.

In that vision, the tools analysis does not succeed in exceeding the questions of the human-machine dialogue which send back to the permanent mixture between the technical instrumentation of human action and its effective work through individual action.

From then on, once the « e » role is evacuated, how do we know at which level of representations development and cognitive operations, the activities based on tools intervene ? Today, the stake is not any more tthe « new » tools integration. The stakes are connected to the questions arising from the educational or not use of the tools. In the case of the ICT, tools belong to a « distributed cognitive system » (Hutchins, 1995). They are artefacts which amplify human capacities and modify the task and the activity. They organize our vision of the world through the distributed knowledge and the shared social practices which they authorize (Bateson, 1972). They propose resources for the structuralization and the execution of human actions (Norman, 1993 ; Lave, 1988). They facilitate reflection, thought, and start an intellectual activity. When they modify the cognitive activities, they are the cognitive artefacts. (Norman, 1993). When they modify the communication activities , they are « communicationnels artefacts » (Agostinelli, 2003) that amplify the communication, organize the human interaction, modify production ways of management and data processing ...

3. The artefacts

The artefacts approach finds its source in objects which are produced by the man. Objects are social constructions (Simondon, 1989) and their development depends strictly on the specific operating mode and on the users' reflection on their aims. This active participation of the individual using the tool modifies its « nature ». From the tool, it becomes instrument. It means that it gives a direction to intentionality, to the reflection and changes the human activity. Eventually, it activates an intellectual activity.

The artefact mediatizes our vision of the world without including ourselves in the phenomena of which it instruments the reporting. It is a process to think our relation to the world, not the world of the globalization, but the local and private one. The world in which the man is member of a community, a group, a tribe.

For us, etymologically, the artefact is an *artis facta*, an effect of art. It is a gradually elaborated construction which happens during mediation in order to reach a representation that can be as methodically dismantled as it has been imagined. This happens in order to become undeniable to the user. Of course, art is understood here as a capacity, a skill to make « something », but also as a set of means, processes, rules regarding an activity or an occupation. It includes the activity that leads and considers the set of rules to be followed. It includes the set of creative human activities of works containing rules which become the rules of the discipline it concerns.

Concerning the word *effect, make*, (influence), we consider it as the result of an action and of what is produced by « something », provoking as an action as a reaction. In fact, all art of influence can give place to subjectivity following the context, the use and the practices. Some pieces of art become « good objects », good constructions because they are linked to social while they are making it partially. In this case, they have got the peculiarity to subscribe to the society through all their characteristics. Others, as technical objects or « fetishes » objects (Latour, 1995), are detached or objective objects which we do not often know how to connect to the rest of the social world.

The art effects can then provoke interpretation or understanding mistakes and, even, hostile reactions. Therefore, a contextual vision is necessary for observing the artefact. It is neither coming from the means, because they considerably vary according to different points of view, nor coming from the purposes, because the possible issues which are authorizing them are not purpose in itself, strictly speaking.

As a result, practices are not any more the essential heart of the relation man-artefact considered as a single solution to the « taken into account » problem (Rabardel, 1995) but only an immediate situated solution which is not projective. In fact, the practices (or the uses) are not the demonstration of a relation man-artefact which is similar to itself, which would appear and would reappear at various times in an universe which would recognize this relation and that the relation would recognise this universe. They are as a passing concordance of diverse components. These components are deducted by reading in context the decision-making model which emphasizes the relationship between the observable actions and the decisions taken by the individuals in the context. From this point of view, the daily learning in a classroom is not more « natural » than an instrumented learning. In that case, artefacts are not « except natural ».

We insist then, not only on the results of the action, but also on its various phases in order to seize its coherence. The difficulty of such a reading lies in the nature of the operated processes: sensations, perceptions, values, knowledge... An artefact is at first a sight of the spirit which associates the human interactions, the mediation of tools, the cognition and the learnings.

In fact, the essential question regarding artefacts lies in the relation which exists between the world of artificial representations and the way we represent ourselves the « real » world. The artefactual process is thus a relational, individual process which builds an interpretative system of knowledge and manners in individual mind. This system helps an individual to understand the world, but only

regarding the idea that he has made of it and which is the foundation of the artefact. The artefactual process is the process of interdependence which gives meaning to the information on the context. It organizes these datas in the cognitive system which handle them and which is itself the engine of permanent learnings by linking the technologies and the practices to the educational situations and to the instrumented learning.

4. The theory of three worlds

The e-learning would thus be an artefact which teachers can use to demultiply their capacities of action on the trainings. It is also an artefact which the students can use to increase their potential of production and increase their power on the world of the knowledges. The actions from some and others constantly modify the educational context which becomes « shared » and which builds itself culturally as a possible world (it means to say as an artefact).

For us, ICTs belong to each of three worlds referred by Popper (1994). In that sense, ICTs allow at the same moment the production of ideas under material shape (tools, applications), but also a subjective use.

- The world 1 is the one of physical realities. It is the world of the objects that we can touch, manipulate. It exists independently of our experience. The ICT and our knowledge are real but absent objects, as is a jack in a car trunk which runs, or as physical laws which permit to elevate the car for changing the wheel.

- The world 2 is the one of our conscious experiences and the one of the knowledge which remains subjective because it does not exist out of the relation we have with it. For instance, it is the fear we can have in front of a machine or the pleasure as we are driving our car. It is also, the world of ICT virtual objects. Files, garbage, routine connection are not real or physical objects. To manipulate them, the user has to go through his mental and semiotical representations.

- The world 3 is the one of the objective knowledge, represented by all the theories, the models, the datas; all the information at our disposal which exist independently from the relation which we have with them.

Through these three worlds, the building process of the knowledge keeps us in touch with objects by our experiences in the world 1 . Our knowledge is lived in the world 2 which is the world of symbolic representations, the spirit and the thought. In the world 3, our knowledge is influenced by all the knowledge, the theories, the representations which we have.

The passage from the subjective knowledge (world 2) to the objective knowledge (world 3) is made by the formalization of models and theories which become, at their turn, knowledge and can be subjected to the criticism and to experimentation.

For example, when I am surfing on internet, my laptop computer or cellphone belongs to the world 1 of the material realities.

The feelings that I have by creating my profile on Facebook as the felt desire of meeting someone belong to the world 2.

My laptop computer is real and my feelings are also real because I am living with them. But they are not " objective " and timeless feelings because they depend on my knowledge, on my use, on my know-how of the world 3.

If I am able to objectivize my practices, therefore I can identify what are the psychosociotechnical models that I am using to communicate on Facebook. I can objectivize the role of the ICT on the observed phenomena and thus discuss presuppositions and/or theories to adapt them to the observed situations.

This approach is presenting two interests :

- In the world 3, the individual builds knowledge which have got an appropriated and superior wealth to those that he uses when he establishes this knowledge. The ICT is a good example: indeed, these technologies manage more information today and offer more interconnection capacity between them than an isolated human mind can handle. There is thus a stake in autonomy of a complex system belonging to the world 3. The such created knowledge enters in interaction with other knowledges and organize new forms of knowledge which are advisable to study.

- In the world 2, our subjectivity is influenced by the new forms of knowledge of the world 3. Among of that, they have an autonomous existential shape and modify the previous knowledge: all what we consider as stable as our culture and our perception of the world 1. All our knowledge, observations, practices are impregated with models having a theoretical or cultural background. This background gives a direction to what we think of being a « naive » observation of the reality.

If we know that the extension of our finger with the mouse to manipulate virtual objects on a metaphorical desk has nothing more intuitive, can we clarify at which collaborative level intervene tools in the construction of a common sense or a didactical contract in a virtual classroom ?

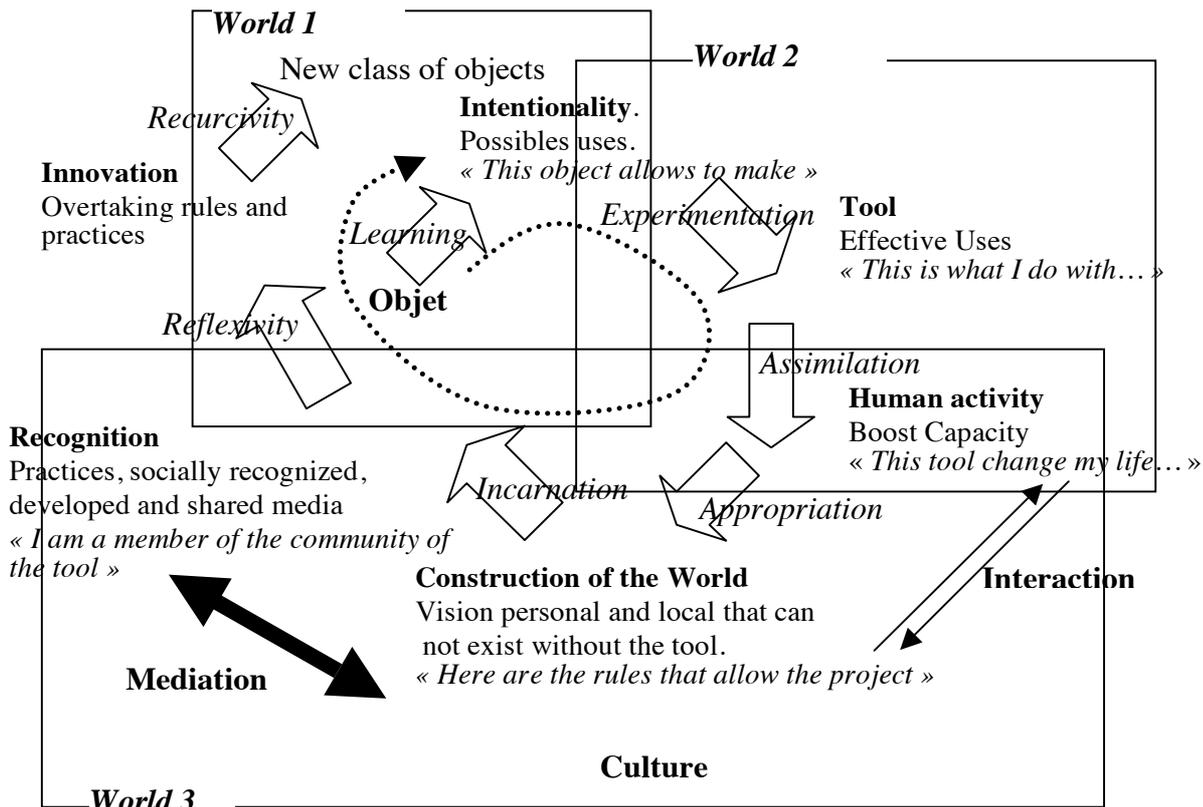
What are the models which are integrating tools and describing the role of instrumented communication in the negotiation processes that are occurring in the communities of practices that are sharing knowledge ?

5. The artefactual process of getting in touch of the worlds

Our model is looking at the artefactual process in its cultural aspect within a community where objects are the product of human activity to which the members attribute intentionality. Its main aim is to seize ICTs as the performance of culture in which the knowledge is considered as human works which are the object of a cultural socially organized transmission (Meyerson, 1995).

In other words, the question is here to understand the artefactual process as a mediation for knowledge transmission process. The interaction is then seen as an act of contextualisation by which the tool allows the individuals to manage collectively the knowledge which is situated in a working environment. This contextualisation authorizes to outdistance th primordial construction of use situation and allows to look at the knowledge as a stable situation (because acquired and put in memory by the community). This also allows their probation in another context. This is the foundation of the learning and what has characterized the headway of the interpersonal exchanges through the time. In a situation of learning, what we call contextualisation is, in fact, a recontextualisation thanks to the other situations of the same type or the one close to the same type. The contextualisation becomes less and less present. The information is going to become « tools » (in the vygotskian spirit) that the individual can use in other contexts

The process begins in the world 1 with the *discovery of the object* and the associated questions; « To what kind of use? In what is it made? Etc. ». It is the *intentionality given to the object* that authorizes it a possible use, « this object allows me to make ». With the learning and the experimentation we build a subjective knowledge connected to the personal relation which we have with the object and with this knowledge, « here is what I make with... ». The tool evolves then towards a established and considered normal use, it becomes a personal tool and an announcement, by the terms « this tool changes my life », actions on, by, with the tool. It is between the worlds 2 and 3 that intervenes the interaction which recovers from the organization and from the genesis of the knowledge. The mental construction of the knowledge plays, in every stage, a central role in the apprehension of the environment, and in the possible effects on these same knowledge. In *the social construction*, the intersubjective reality is in permanent construction thanks to the conflicting representations. The representations, which elaborate, translate the interiorized constructions which transform the reality in successive really situationnal bit by bit. The individual builds himself then by a system of interaction.



Plan 1: the artefactual process

This system is the building context result which occurs simultaneously in the progress of the exchanges which allow the creation or the improvement of a voluntary and reflexive process. This process authorizes the individual, a planning of his action for achieving his aim thanks to a bigger structuralization of this context and a better management of its activity.

In the social construction (Berger & Luckmann, 1997), the intersubjective reality is in permanent construction thanks to the conflicting representations. The representations, which elaborate, translate the interiorized constructions which transform the reality in successive really situational bit by bit. The individual builds himself then by a system of interaction. This system is the building context result which occurs simultaneously in the progress of the exchanges which allow the creation or the improvement of a voluntary and reflexive process. This process authorizes the individual, a planning of his action for achieving his aim thanks to a bigger structuralization of this context and a better management of its activity. In the construction of a personal and local world, the culture is « all the descriptions, more or less connected from some to others, more or less normative, which tell to us, among other things, how "work" the people, what look like our spirit and how we have to act in precise situations, which are the various possible ways of life and how it is necessary to stick to it » (Bruner, 1991, p. 49).

The culture bequeaths us « prostheses » (artefacts) which allow us to transcend the rough biological limits (the limits of our memory, for example). The mediation is envisaged here as an interaction amplified by a media (a tool) which has to consider two aspects. On one hand, a tool allows to realise actions that would be difficult to realise without it but restricts and models the actions which it mediates. On the other hand, according to a vygotskienne perspective, a tool is above all, a tool of the spirit. This mediation finds naturally its roots in the human relations and the forms of a ritual communication (Bateson, 1971) which allow to model the types of social interactions in specific cultural contexts. The second foundation refers to Hymes (Hymes, 1982) for whom, the daily linguistic practices of the people show the way they build up the social. From then on, to kick away

the rules of functioning of these practices allows to describe the way the individuals associate particular modes of dialogue, information and transmission of messages with places and specific activities.

The recognition is always a certain types of *social order* (Douglas, 1986) in which the individual becomes member because he is there predictable and recognized. The shared manners are permanently reconstructed by the facts, the gestures (movements), the exchanges (Goffman, 1963). The community is then based on the acceptability and the previsibility that have to offer in any situation the members of a given culture (Goodenough, 1957). The common knowledge *are the collection publicly shared by principles and by values used every moment to justify the behaviors* (Douglas, 1986) but also, this quite complex which includes the knowledge, the faiths, the art, the morality, the law, the customs, and the other capacities or the customs acquired by the man as member of the society.

Finally, the innovation finds its source in the overtaking manners, in the capacity to produce new objects in the world 1 by changing and by organizing those which already exist from the knowledge obtained in the world 3. The main characteristic of the innovation is then, a capacity to modify a way of thinking according to the context in which it is made. The new object discovers links between knowledge which, a priori, have nothing in common and nevertheless to transform the tool of departure.

To conclude this artefactual process, the tool always has a mediating function on the man action on the world: it is used to act on and with the others; it also modifies its user because it also serves for acting on itself. A tool is always socially created and used by and for the purposes and the needs of the collective action. This social nature confers it a sharing function of the objectives; a coordination function of the community member activity; a communication function which builds itself through the interactions and the social mediations. It is also the mean, given to the community member, to become, at the same time, the subject and the object of his own activity on the world.

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