A METHODOLOGY TO EXPLORE AND UNDERSTAND
THE ACTIVITY OF THE HYPERMEDIA USER

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INTRODUCTION

During the previous forum (Paris, April 1997), I had the opportunity to present my current research work, the object of which was the learning experience that young people make with the new media. The question behind this research was (and had remained) to try to find out if the new media introduce a significant change in "the learning experience" (I will come back on this term just hereafter to clarify and to specify it), that is if "the learning experience by or with the new media" can be effectively qualified as being different or new when compared to "the learning experience in classic, not technologized environments". The underlying idea was to test the assertion (becoming current nowadays) that we have entered with the new media in an era of mutation and deep transformation of the relationship to knowledge and to learning. Is there really a change or revolution, are we authorized to speak in these terms and if it is the case, in what measure and in what direction(s) does the change go ? Such was the general question at the basis of this research.

In the course of this work, I have focused on a more specific research object, i.e. "the hypermedias on CD-Rom "(this led my interest to the particular case of computer games on CD-Rom).[1] The research being at that time still running, I essentially presented the theoretical framework, main hypotheses as well as some temporary or partial results. This work is now finished (and in process of publication). I have had the opportunity to specify the theoretical framework and to think about a relevant methodological way for such research. I would like to develop this methodological side in the present contribution.

1. THE CONCEPT OF LEARNING EXPERIENCE

Before coming to the presentation of the empirical approach that has been specifically undertaken, it is necessary for me to specify the meaning of the concept of "learning experience" that I have adopted and which is used as dependent variable in this research. To define this concept, I among others refer to works of a French psychologist, P.

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[1] According to Balpe (1990), the term *hypermedia* designates any *computerized document*, containing information of *multimodal* nature (texts, sounds, images) organized in *nodes* connected by *bonds*, allowing the reader or the user *multiple reading trips* inside the document. In my opinion, computerized games constitute a particular category of hypermedias. Even if classically they are not designated under this term, formally, computerized games satisfy to the definition of a hypermedia. One can even say that they carry to a maximal degree characteristics attributed to the hypermedias in the scientific literature, since in some games, each element of the screen constitutes a node, a button on which it is possible to exert an action, so that the "reading trips" become effectively in infinite number within these games.

Vermersch.[2] To tell it simply, by "learning experience", I mean "what the subject tells about what he does ", in other words the verbalization of the action undertaken by an individual in a given learning situation or environment.

I distinguish this concept of learning experience from two other concepts which are close, perhaps structurally linked, but which designate objects of a different kind :
• on the one hand, the concept of "conception of learning", which designates "what the subject tells about what he thinks" on his learning or on learning in general (in other words, his representation of the learning process) ;
• on the other hand, the concept of "learning practice", which designates "what the subject does", the actions he effectively undertakes in a given learning situation.

In my opinion, the concept of learning experience doesn't refer exactly either to one, nor to the other of these two other levels. It defines a specific level of analysis which is intermediate, one could consider, between the representation level and the practice level and which, according to Vermersch, has hardly been seen, nor hardly been exploited in the scientific research up to now.

2. THE METHOD

I can now come to the presentation of the empirical method. As one will have guessed by reading what precedes, the starting point of the research has consisted in realizing interviews. I have worked in this research, if I may insist, on the level of the discourse and not directly on the level of facts. For these interviews, I have targeted a public of young people of 16 to 18 years, " heavy consumers of new medias in their private environment". A bit more than twenty thorough interviews have been realized with young people corresponding to this profile, as well in France as in Belgium. One of the reasons of the choice of this public resides in the fact that these young people are probably pioneers who announce, or even incarnate as from now this new "cybermedia" culture in progress. Furthermore, being still in age of schooling, these youths present the interest of being committed at least in a double learning experience, the one that they make at school and the one that they live through their practice and their passion of the new medias. As compared to the problem in question, there seemed to be a favourable field of investigation for a comparison between "the learning experience with the hypermedias" and "the learning experience without hypermedias".[3]

I'm now going to present synthetically the whole empirical operations that have been realized. I will distinguish in this the three classical steps of a research in social sciences : the collection of the information, the processing of the information and the display of the data.

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[2] Although I don't entirely use the same vocabulary than this author.

[3] I have nevertheless to specify that with the number of realized interviews and the approach that has been chosen (which has not gone through the constitution of a representative sample), this research is essentially a qualitative research, with an exploratory vocation and not a research the results of which could pretend to any generalization.

2.1. THE COLLECTION OF THE INFORMATION : THE EXPLICITATION INTERVIEW AND THE CRITICAL INCIDENT TECHNIQUE

On the level of the collection of data, I sought at the beginning a method of interview focused on the exploration of the activity of the hypermedia user. For the essential, the idea was to set up a device where subjects would be put in position to produce a discourse on the activities they undertake in hypermedia environments, with the result that this discourse, in spite of the limits of such a method[4], could inform me validly on specific actions developed in these environments.

I was finally strongly inspired by the approach of "the explicitation interview" [my translation for "l'entretien d'explicitation"] elaborated by P. Vermersch (Vermersch, 1994). I would like here to relay this author when he underlines the interest of this method for researchers, but also for practioners in the area of learning, education and training.

> The explicitation interview constitutes a set of techniques that have for purpose to favor, to help, to request the expression in descriptive words of the manner in which a task has been realized. The explicitation interview aims therefore primarily at the verbalization of the action, the way it is effectively achieved in the execution of a precise task. (Vermersch, presentation, internet site of the GREX[5]) [my translation]

So the explicitation interview constitutes a method specifically conceived to favor the expression of the knowledge used in the action. Now, it is necessary to realize that this step is not evident for the subject questionned on this matter. "To verbalize an action is not usual, we have never been trained at this. What comes in first, spontaneously, are rather judgments, comments, generalities or a description of the circumstances" (Vermersch, 1994, p.18). The main source of difficulty comes from the fact that action, as Piaget himself underlined (1974a), is an "autonomous knowledge". It generally concerns an implicit, not conscious knowledge and this is why this knowledge is often opaque and difficult to express for the one who achieves it.

This aspect constitutes one of the reasons why the discourse, in social science methodology, is often considered as suspicious when the purpose is to grasp and to understand the logic of an activity or a practice. If the discourse clearly constitutes a way of access to representations of the person (his opinions, comments, beliefs, arguments, reasonings, judgments...), it is nevertheless not sure that it can inform us on his actions. Vermersch however applies himself to show that ways of access to the action through the discourse are possible. "If the activity is not conscious, it can nevertheless be made conscious"..., be it within some restrictions. The evolution of the knowledge in the act to the full conscience of it and to its verbalization is possible, but it can only be obtained, he says, by a mediation, an assistance or an extremely well-focused guidance.

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[4] A procedure by interviews will never be able to allow the knowledge of the whole of the subject's activity. The concept of "learning experience" is from this point of view incontestably restrictive as compared to the concept of "learning practice". This point allows to underline one of the limits of the method adopted in this research.

[5] GREX = Groupe de Recherche sur l'Explicitation — site : http://www.es-conseil.fr/GREX/.

This guidance is precisely the object of the explicitation interview. This point puts the light on the very focused character, but also the specific difficulties of this approach. "Efficient techniques in bringing this assistance are largely counter-intuitive", Vermersch explains (Vermersch, 1994, p. 18). The naive attitude consists in general in trying to bring an assistance by demands of explanation ("why"... do you do that or so ?). This type of assistance appears ineffective and inappropriate, because it orients the individual in fact to a posture of argumentation rather than to a posture of exploration of his own activity.

Vermersch emphasizes some major principles for the explicitation interview to reach its purpose :
- it's essentially necessary to request descriptions (concretely : to ask the detail of effective actions, their sequence, their succession in undertaking a task) ;
- it's always important to refer to a task or a real and specific situation (concretely : "and when you..., at the moment when..., while..., how do you do it, how did you do it ?").

On the other hand, Vermersch recommends to avoid :
- requesting abstractions, conceptualisations, arguments or the simple relating of circumstances (interventions like "what do you think", "tell me about", "explain to me" will be relatively inappropriate) ;
- having someone speak about the action accomplished "in general" ("what do you mostly do in that case,... "), this already being an abstraction.

So, it's on this basis that I have tried to lead the interviews with the young hypermedia consumers I have met. To realize these interviews, I was also inspired by an approach known under the name of critical incident technique (according to Flanagan, 1954). Specifically, I have invited each of the young interviewed subjects to tell me and describe four learning experiences they had made, i.e. :

1/ an experience "with hypermedia" that has been perceived as a rich or positive learning experience ;
2/ an experience "with hypermedia" that has been perceived as a poor or negative learning experience ;
3/ an experience "without hypermedia" that has been perceived as a rich or positive learning experience ;
4/ an experience "without hypermedia" that has been perceived as a poor or negative learning experience.

This device can be represented in a table as follows :

	Environment with hypermedia	Environment without hypermedia
Positive experience (+)	1	3
Negative experience (-)	2	4

By operating in this manner, I have thus constituted a corpus of stories of learning experiences (with in principle four stories at least by individual), these stories being among others punctuated by expressions of actions refering to steps achieved by the subjects in the different environments. From there, it became possible to process these stories for purposes of comparison.

2.2. THE PROCESSING OF THE INFORMATION : A CATEGORIAL APPROACH

I have then started the second stage of the empirical work, which consisted in examining activities verbalized in the different stories of experiences in order to grasp what could distinguish experiences made in hypermedia environments and experiences made outside this universe (that is the two columns of the above-mentioned table). To undertake this work, I had beforehand to dispose of a theoretical model of learning, which mentions and differentiates the essential dimensions or the main types of activities included in learning, conceived a priori in the largest meaning of the term.[6]

By refering to Piaget, Vygotsky and Bruner, three great theoriticians in this field, I have built a conceptual model of learning (and consequently of the learning experience) whose basic typology I will only introduce here. Practically, I distinguish five dimensions in learning (in other words, I consider five great types or categories of activities possibly included in a learning process or experience), that is : a representational dimension, an operative dimension, a reflexive dimension, a psycho-affective dimension and a social dimension. I shall clarify each of these dimensions briefly here below.

1. The representational activities
   (ex. : to read - to look - to listen - to reason - to understand - to solve...) :
- they are applied on representations, that is on an object or content of symbolic nature (written or spoken texts, images, graphs...) ;
- they aim at the mastery, the assimilation, the processing or again the comprehension of this content ;
- they mobilize essentially resources of the spirit, rationality, logic.[7]

2. The operative activities
   (ex. : to manipulate - to construct - to manufacture - to move - to try - to experiment...) :
- they are applied on an object of the environment (generally a material, physical object) ;

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[6] Effectively I have adopted in this research a very large conception of the term "learning", a conception not reductible to learning in the school-related meaning of the word, to the acquisition of knowledge contents. On a general level, learning, in the western culture and even in some scientific circles, is often reduced quasi exclusively to an activity of information processing or to a work operated on representations. But, one cannot, I think, assimilate these two notions. There can be information processing without learning (ex. an adult who undertakes a simple addition processes an information, but probably doesn't learn anything). On the contrary, there can be a learning without strictly an information processing (especially in the learning of gestual know-hows - ex. : the learning of how to swim). Inspired by the theories of situated action (or cognition) (Lave, Suchman...), I am inclined to bring together the notion of learning and that of action (or activity), taking into account that learning is quasi co-extensive to all the actions or interactions the individual develops with his environment. Potentially at least, every environment is susceptible to constitute a learning environment for the subject from the moment that it mobilizes an activity of him. I however lack space here to develop and argue this point of view.

[7] This dimension aims in other words at activities of information processing.

- they aim at the mastery, the experimentation or the manipulation of this object or this environment ;
- they mobilize essentially resources of the perception (the five senses) and the motricity (mechanisms of movement coordination).

3. The <u>reflexive activities</u>
   (ex. : to wonder - to reflect - to seek - to become conscious - to decide - to manage...) :
- they suppose first a movement of distanciation or abstraction from the "outward-oriented" activity (representational or operative activity) — in other words, they suppose a break in the action in favor of a "return on himself" on behalf of the subject ;
- they involve then an act of invention, an act of creation, an act where a certain individual autonomy can be observed (from this point of view, I propose to establish a clear distinction between "reflection" and "reflexivity") ;
- they finally open on a return or on a new commitment in action.

4. The <u>psycho-affective activities</u>
   (ex. : to take time - to concentrate...) :
- they aim at the management of the personal, intra-psychic investment in the situation.

5. The <u>social activities</u>
   (ex. : to meet - to speak - to ask - to expose - to confront...) :
- they aim at the management of the social interactions, interindividual relations (encounters, exchanges, dialogues, discussions) in the situation.

On the basis of this typology, I have, for the essential, realized a categorial processing of the whole of my corpus. I have thus examined each my interview by noting all the expressions of actions produced by the subjects to describe their activity in the different environments. This examination has led me to underline in my corpus several sub-types or sub-categories of activities inside the five basic categories of my model. Practically, I have identified :

  - 8 types of activities in the representational dimension[8] ;
  - 17 types of activities in the operative dimension[9] ;
  - 10 types of activities in the reflexive dimension[10] ;
  - 5 types of activities in the psycho-affective dimension[11] ;
  - 8 types of activities in the social dimension[12] ;

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[8] 1.1. to read, 1.2. to look, 1.3. to listen, 1.4. to reflect-to understand-to solve, 1.5. to remember, 1.6. to make exercises, 1.7. to classify, 1.8. to write-to take notes.
[9] 2.1. to feel, 2.2. to hear, 2.3. to look, 2.4. to look at someone doing something, 2.5. to touch-to manipulate-to move something, 2.6. to drive-to pilot, 2.7. to construct-to install-to manufacture, 2.8. to circulate, 2.9. to move, 2.10. to take-to seize, 2.11. to attack, 2.12. to shoot-to react, 2.13. to exert, 2.14. to try-to experiment, 2.15. to get inside-into someone's skin, 2.16. to imitate, 2.17. to coordinate.
[10] 3.1. to wonder-to reflect, 3.2. to seek, 3.3. to see how it's been conceived, 3.4. to become conscious, 3.5. to see the time, 3.6. to stop, 3.7. to decide-to manage, 3.8. to manage oneself, 3.9. to rectify-to modify, 3.10. to see in another way-to understand.
[11] 4.1. to take time, 4.2. to concentrate, 4.3. to choose, 4.4. to feel, 4.5. to contemplate.
[12] 5.1. to meet, 5.2. to speak-to communicate, 5.3. to ask a question, 5.4. to expose-to present, 5.5. to form an alliance-to act in concert, 5.6. to confront, 5.7. to command, 5.8. to buy-to sell.

Each expression of action in my corpus has so been assigned to one of the five basis categories, as well as to one of these under-categories of activities.

2.3. THE DISPLAY OF DATA : A GRAPHIC APPROACH

Supplied with the results of this categorial work, it became possible to construct and to represent profiles of the learning experiences associated to the different environments. By relying on research in analogical communication and in graphic semiology (notably works of J. Bertin), I have tried to identify a method of graphic representation of these profiles. In this third and last operation of processing, I have tried to emphasize the readibility and the accessibility of the results of my research, while taking the complexity of the obtained data into account.

The idea was to represent, in a synthetic table, the importance of each category of activity in the different profiles with a graphic symbol (concretely, a small square, more or less black or white). Specifically, a black square indicates an activity represented in all the stories of experiences associated to a particular environment, while a white square indicates an activity absent in these stories. The different intermediate versions will express the more or less present (strongly or weakly) character of the corresponding activity in these stories. This graphic system allows to visualize the relative peaks of activities mobilized in the different environments and to finally represent the profile of each type of experience (with or without hypermedia).

The main part of the next analysis work consisted in comparing these different profiles, in order to grasp on which elements they possibly differentiated from each other.

3. PRESENTATION OF SOME RESULTS

By lack of space, I cannot present and develop all the results of this procedure here. In the oral statement, I will expose some of the most significant results of this research, in order to illustrate to the kind of results one can get or what can be stressed with such a method.

4. CONCLUSION

There are without any doubt many relevant methodological ways to apprehend the experience, practice or use made by youths of the media (new or old) and to examine the different experiences in presence. I have only presented one of them here.

In conclusion of this contribution, I would wish to emphasize the necessity of a methodology that I would qualify as "interactionnist". It seems to me that one of the main difficulties in this matter is to identify a way that allows us to study the interaction between the subject (user) and the object (media) rather than to focus the analysis on one or on the other of these two poles.

From my point of view, a certain number of methodologies are problematic on this point, either because they focus exclusively on the object "media" (the structure of which they study in detail), or because on the contrary they focus exclusively on the subject ("user" or "learner") (whom they study in a context where the object is

relatively absent). In the first case, one risks to end with a determinist approach (i.e. the tendency to determine the socio-cognitive behavior of the individual only on the basis of the structure of the object) ; in the second case, one risks to end with a psychologically-tinted or mentalist approach (i.e. the tendency to determine the structure of knowledge and thought only by the constitution of the subject or of the human spirit). Now, determinism and mentalism constitute two antagonistic versions, but which nevertheless refer to a same paradigm, the dualist paradigm. Rather than a separation between subject and object, it appears necessary to think subject and object in a narrow interaction, to construct an approach that emphasizes this interaction in the analysis of these questions. Such appears to me one of the fundamental methodological questions to solve in our field of research.

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