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Flip the Flipped Classroom. Experiential Reason and New Technologies in Adults' Education.

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ABSTRACT

Flipped classroom is not a recent pedagogical idea but it flourished with the emergence of new technologies in education. This method is applied approximately the same way at all levels of education. The idea is simple: students learn the theory of the course by using distant learning and they apply afterwards, this theory during in class exercises and group work. However, this method remains, in our opinion, very didactic. How can we adapt the flipped classroom in the field of adult's education? This article proposes to contribute on the field of research on alternative learning. To do so, we use as theoretical framework the researches on the *experiential reason* and the *semiosis* of Peirce. After a look to the characteristics of the flipped classroom, we analyze the pragmatism of the three reasons so that we can conclude with a systemic proposition of the flipped classroom in the adult's education context.

Keywords: Experiential Reason, Alternative Education, Flipped Classroom, New Technologies, Pragmatism

1. INTRODUCTION

Ivan Illich, since 1971, was proposing the *deschooling of the society* because the school system is choosing those who are destined to succeed [24]. His criticism concerns, among other things, the organization of the school system by school subjects based in a referential logic. The school system "wants to achieve all the goals at once, [...] (it) recognizes only compulsory education programs, where all subjects are confused" [23]. Does the use of new technologies in adult's training follow the same referential logic? In other terms, do they promote the reference on the school programs and objectives rather than the learning by doing based on the inferential logic? How can digital platforms take into consideration the experience of the learner, whether they are used in e-learning, Mooc, flipped classroom or blended learning? How can we escape from the dichotomy between theory and practice but also between distance learning and face-to-face learning as we can observe in the organization of the flipped classrooms?

¹Alternative education or work-integrated learning is a pedagogical method that combines education in an academic institution with training in a professional setting. More widely, it promotes the alternation between theory and practice in the learning process. "The approach has attracted a renewed interest in Europe in the past few years because of its potential for motivating students, reducing student attrition, and raising the level of entry-level vocational education" [1].

Our own researches on experiential adults' training and alternative training¹ for many years now have enriched these questions. In this article, we propose an analysis of blended learning based on flipped classrooms. We use as our theoretical framework the researches of Denoyel on pragmatism and the three reasons as well as our own researches on adults' education.

2. FLIPPED CLASSROOM

Flipped classroom is a quite old pedagogical approach that regained popularity after the explosion of the use of new technologies in the educational field. It is considered for many practitioners and researchers as an innovation in education. The idea was introduced in 2012 by two American chemistry professors, Bergmann and Sams² [40]. Its principle is simple: the students learn the course in distance by using videos and digital resources, and then apply these theoretical materials by doing group work in face-to-face classroom [46]. This method changes the traditional way of bringing theoretical knowledge by reversing the roles. The teacher is no longer the sole holder of knowledge but becomes a facilitator in-group and in individual work.

Mazur [32], is one of the pioneers of the flipped classroom. He points out that trainers do not spend energy anymore in order to transmit theoretical knowledge because learners are autonomous in learning the new contents. There is therefore, more time for group problem solving, the possibility to consult the contents at any time via the platform and a peer-to-peer learning [18]. In doing so the learner gets responsibilities and becomes autonomous. However, this organization still supports the traditional didactic conception of an information [30] solely transmitted by the teacher (in distant learning) and the application of the theory by the students (work in classe). This is maybe the explanation for the questionable results [2] of the researches done on the flipped classrooms [19, 44].

Marcel Lebrun [29], proposes to put the emphasizes on face-to-face moments so that they become meaningful for the student, rather than on the externalization of the school contents by the use of that leads him to define a systemic model of flipped classrooms.

²Historically, Jonathan Bergmann and Aaron Sam, chemistry teachers at Woodland Park high school in Colorado, introduced the flipped classroom in the 2000s. It owes its popularity among others, to Salman Khan, founder of Khan Academy. He proposed the use of his education videos in order to *flip* the classes at his Technology, Entertainment and Design (TED) conference in March 2011 [2].

Flipped Classroom: Lebrun's Analysis

Lebrun [26, 27, 28], defines a continuum between teacher-centered and learner-centered practices.

At one side of the continuum, we find the flipped classroom (type 1) as described above and on the other side the *inverted* [4] or *translated* [28] classroom where the students built their course in autonomy (type 2). In other words, learners search for information remotely by performing research and preparatory work in order to share it later during a face-to-face classe by doing presentations and modeling work. This leads us to a third type (type 3) that would be a mix of the two others.

Therefore, there is not just one model of flipped classroom but several, which correspond to the different scenarios realized thanks to the alternation between types (1,2,3) and modalities (distance, presence). Thus, Lebrun constructs a flipped classroom example, which he relates to the cycle of Kolb [25] and the constituents of Tardif [45].

However, all these scenarios remain in a referential logic. In other words, there is a content, which is part of an educational program that students need to learn. Any of these approaches aims at acquiring skills such as searching information, validation, creativity... based on case studies or problem solving situations that are not necessarily specific to the learner. Lebrun in his interview with Tran [27] notes that the traditional courses and flipped classroom should not be opposed.

However, in order to give meaning to adults' education, it is essential to take into account their experiences. How can the flipped classrooms allow the learner's own experience to become a formative experience? We propose to begin with the analysis of the theory of pragmatism as developed by Peirce.

3. PRAGMATICS IN ADULTS' EDUCATION

After a short analysis of the flipped classrooms and of the theoretical and empirical researches that accompany them, we note that there have not been many researches on the way it may be used in adults' education³. Even if this method claims to correspond to all levels of learning, from kindergarten to university education, we believe that it needs to be adjusted to the specificities of the adult learner. Researches on adults' education done for several decades, demonstrate that taking into account the experience of the learner is essential in order to give meaning to the training of the learner. Thus, we propose to advance the work presented above by modeling this spatial and temporal alternation. The theory of pragmatism and semiotics of Peirce and the theory of the three reasons of Denoyel, will allow us to clarify the place given to the experience of the learner in blended learning environments.

The Semiotic Studies of Peirce

Charles Sanders Peirce (1839-1914) [7] is an American philosopher and one of the founders of pragmatism⁴, a philosophical tradition with decisive consequences in education. Pragmatism considers that an idea can be validated only through its concrete implications. In other words, practical success is the only criteria of truth. As John Dewey said, « if a theory does not affect education, it is certainly artificial » [20]. Pragmatism shift practice, in the center of the pedagogical process.

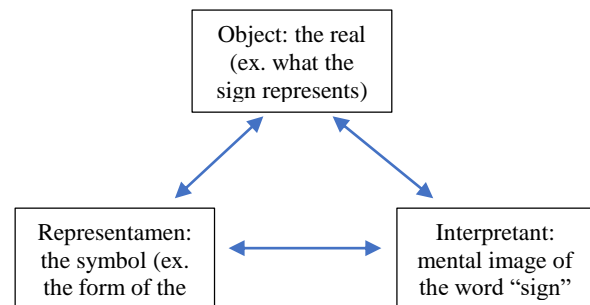
³ Only 15 results found in the ERIC platform after using the key words : flipped classroom adult

⁴ The three main founders of pragmatism are Charles Sanders Peirce (1839-1914), William James (1842-1910) and John

Peirce divides science into three parts: mathematics, which he considers as ideal constructions disconnected from reality, phenomenology, as a study of phenomena or lived experiences, and pragmatics as "the study of the behaviors we should adopt at the light of experience's truths" [39]. According to Peirce, pragmatics' purpose is to know what to do and how to do it [39]. In 1867, Peirce in his publication *On a New List of Categories*⁵ develops semiotics, the study of sign process based on the logic of inference. The use of signs as described in this theory, makes the individual capable of learning by experience. According to the author, the existence is based on three philosophical categories of being : firstness, secondness, thirdness. The firstness, is the quality of the feelings, ideas, a possibility. It is the human being in its presence, it is what is lived [3]. The secondness is the action, the fact, the concrete « in a raw state not reflected but lived as such » is the conception of being in relation to something else. The thirdness is the thoughtfulness, the generality, the attempt to explain things, it is the mediation that connects a first and a second.

Based on these categories, he defines semiosis or semiotics as a triadic relation between a representamen or sign (first), an object (second) and an interpretant (third). This is a meaning producing relation [15]. The representamen is a first, a possibility, a representation, a conception of being independent of anything else. The object corresponds to the context, to what exists, to what I refer to, the conception of being relative to something else. Finally, the interpretant is the law, the rule, the habit that allows mediation and relation between the sign and the object. It is the human action and thought. For example, if the representamen or sign is a word, the object would be what that word represents and the interpretant is the definition of the word. This triadic relation known as semiosis, is an unlimited process. Indeed, "we are engaged in a process of thought that is still incomplete and has already begun" [22]. The figure below schematizes this idea by giving the example of a street sign.

Figure 1. The triadic relation of semiotics



He distinguishes three categories of interpretants : the immediate interpretant or representation according to Denoyel [8], the dynamic interpretant or sense, and the final interpretant or meaning. The first corresponds to "everything that is explicit in the sign regardless of its context" (Peirce, 5.473) [41]. The second one corresponds to the interpretants "who have a real independent existence" [41]. Whereas the final interpretant corresponds to the human habits. As explored above, the

Dewey (1859-1952) [17]. Pragmatism developed in the United States in the 19th century. This term derives from the Greek word *πραγματα* (pragmata) which refers to action.

⁵ 1.545-1.559. This figure corresponds to the volume and paragraph number of Peirce Collected Papers [21].

semiotic process is endless. Any interpretant is a sign that can be interpreted by another interpretant. However, “the habit stops provisionally the infinite send of a sign to another sign, allowing the interlocutors to quickly agree on reality in a given context of communication. The signs cause reinforcement or modification of the habits” [22].

The habit gets a new form in the theory of semiotics. It is not a fixed state, upon which we return without thinking. On the contrary, it is a living habit that operates on itself to change itself. It is this method of self-criticism and self-correction, of problematization which constitutes the final interpretant. « The final interpretant of any sign is the final and normative habit of interpreting » [44]. The habit is not an automatism because, as a final interpretant and the result of semiosis, it is full of meanings [15].

Three mode of scientifique reasoning are based on semiotics: hypothesis (or abduction), induction and deduction. Abduction supposes something différent than what we have already observed and frequently something that we cannot observe directly (2.640) [6]. In other words, the abduction allows the emergence of new ideas. It is about discovering in the form of a hypothesis, a rule capable of explaining a fact. This approach is also called hypothetico-deductive. According to Peirce, there is no science without hypothesis. “To unravel the mysteries of the world, we need a fertile imagination that will allow us to develop a model” [41].

Induction infers the existence of phenomens already observed in similar cases. We test our hypothesis inductively when we rely on our experiences. Induction results from facts, observation. As for deduction, it is the intermediate between abduction (hypothesis) and induction. It is thanks to her that “we infer from the hypothesis the empirical consequences that induction can verify” (p. 23). The rule is imposed to the facts, it justifies itself as a rule. Thus, “a sign which connects its final interpretant to its object by a formal deduction, formally assures the truth” (p.23). To conclude, it is important to note that, according to Peirce, it is not « the mind and the ideas that explain the signs, but rather the sign theory that explains the mind, thought and ideas” (p. 12).

The Pragmatic of the Three Reasons

Denoyel’s studies, invite us to rethink this triadic relation as a theoretical framework for analyzing the process of giving sense to our actions. In order to conceive the theory of the three reasons, Denoyel relies mainly on the three categories of interpretants : immediate, dynamic and final and the three scientifique modes of reasoning : abduction, induction, déduction as described above. He adds to those, the transduction inspired by the studies of Simondon [43] et Piaget [36]. He thus elaborates the pragmatic of the three reasons : sensible reason, experiential and formal [9, 10, 11, 12, 14].

This theory assimilates the sensible reason to the firstness (possibility) and the transductive inferences (transduction). Transductive logic is analogical, there is no contact with an established rule, but we pass from singular to singular (Piaget, 1924) [9]. Experiential reason corresponds to the secondness (concrete existence) and to two types of inference : abduction and induction. Abduction invents a new rule or formalizes an implicit one. With the abduction we discover the relevant hypothesis by removing the multitude of the possible hypothesis [9]. Induction discovers an already established rule. The experiential reason is the practical intelligence, the metis of the Greeks [16], based on a dialogical logic. As for the formal reason, it is related to the thirdness and deductive inference. It is a tautological logic. It goes from the general, an established rule, to the singular. Denoyel regroups these concepts in the figure below :

Figure 2. The pragmatic of the three reasons (translation of Denoyel) [9, 10, 15]

	Sensible reason	Experiential reason		Formal reason
Peirce’s categories	Firstness (possibility)	Secondness (concrete experience)		Thirdness (law, habit)
Interpretant’s pragmatic	Immediate interpretant	Dynamic interpretant		Final interpretant
Logics	Analogic	Dialogic		Tautologic
Inferences	Transduction	Abduction	Induction	Deduction
General rules	No contact with an established rule	Invent a rule. Formalize an implicit rule	Discover a rule already established	Start from an established rule

In order to understand better these inferential processes of the three reasons, we propose to give some examples. We use the sensitive reason (transduction) when we act without making the connection with an established rule. When we do not follow, for example, the rule of a board game and we use a new. When everyone around the table integrates this new rule into their game, they use the experiential reason (abduction), the invention of a new rule. The basic game rule, formal reason (deduction), then stimulates experiential reason to invent new rules, the latter nourished by the creativity of the sensible reason.

Pragmatism in Adults’ Education

The pragmatic of the three reasons of Denoyel, allows us to establish the link between theory and practice, lived experience and reflexivity in adults’ education. The reflexivity of an adult practitioner is about making the link between his experience and the theory in order to give meaning to his practice and training. The learner has to rethink his habits in order to raise awareness by the reflective activity [15]. They then become conscious, thoughtful actions. “Any professional act requires the implementation of a wide variety of theses habits” (p.191). It is this loop between the formal reason (habit) and the sensible reason (spontaneity) through the experiential reason, that makes the habit progress, change, get in motion, get creative and productive of “a new form” (p. 194).

While working on the dialogue in an alternative training, Denoyel [13] gives to this dialogue three types of action: actoriality, reflexivity and intentionality. In the first step, the actor, adult, professional... acts, lives a personal or professional experience, practices. The adult is in the firstness and sensible reason. In the second step, the reflexivity, the adult gets distant to his experience and reflects on his action individually and in-group. He is in secondness and experiential reason. Finally, he confronts his practical experiences with academic knowledge by giving a perspective to his experiences. He is in the thirdness and the formal reason.

If we recap on the three reasons, the formal reason seeks to stabilize the system, to give a shape to it. Experiential reason “transforms lived experience into a vital experience” [9] through contact with the social world. The sensible reason connects

intentionality with action. We propose to study now, the concrete application of this model in a blended learning environment.

4. FLIP THE FLIPPED CLASSROOM

During the first two parts, we analyzed the studies of Lebrun on the typology of flipped classroom, Peirce's theory on the triadic relation of signs and the pragmatic of the three reasons of Denoyel. We propose here a systemic model of the flipped classroom in adult's education. To do so, we rely on our study about immigrants' education of French as a foreign language in France [34, 35].

We used an inductive research method based on the grounded theory, and a qualitative method for collecting and analysing data by interviewing three teachers of french language. This study led us to the conceptualization of the training of the French foreign language for the immigrants to France as an alternative training. According to Pineau [37], the alternative training is about educational continuity and discontinuity of activities. In fact, immigrants learn in everyday life through direct contact. Any situation can potentially be a problematic situation, from asking for a baguette to applying for a visa, everything should be done in French. These situations can become formative if there is a reflective process. Immigrants are reflective practitioners [42]. In our study, we analyzed four learning situations : experience in everyday life, reflection on experiences during practice analysis groups, learning the grammar rules and written production of a text [38, 31] in French.

The experiences correspond to the sensible reason. Learners must speak in French in order to survive in this new environment. They then, use the French language in an analogical, transductive way. They pass from singular to singular, referring, most of the time, to the knowledge they have of their mother language and other foreign languages. They are therefore actors, praticiens (actoriality).

In the second stage, when they are in a language training center, they participate in practice analysis groups [5]. The objective is to return to a situation they have lived and share it with the groupe. This way they take a distance from the experience and reflect on it thanks to the dialogue with the group. This reflective thinking, allows the awareness of the experience and the learning of the French language. For example, one of the members of the group shares his experience of buying a baguette at the bakery store. He explains that he was not able to articulate his sentence correctly by using the right grammar rules. It was hard for him to make himself clear. After the narration of his experience (by a drawing or orally), the group abductively makes proposals, hypothesis about the correct way to formulate the sentence. They start inductively from their own experiences (singular) and progressively going towards the grammar rules (general). This is a process of the experiential reason based on giving meaning to the experiences of the adults by abductive and inductive approaches.

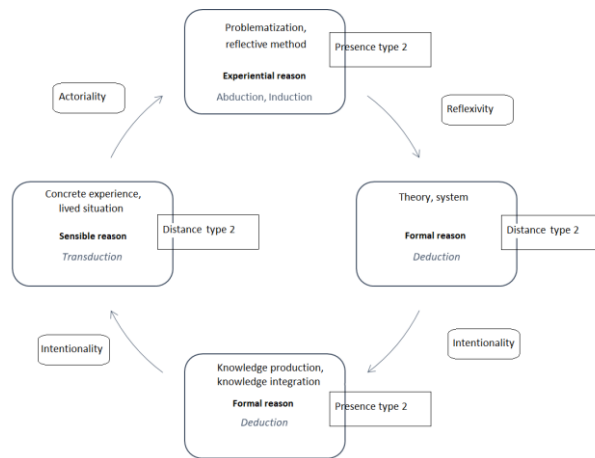
After these moments of practice analysis, the trainer focuses on the theoretical elements that emerged from these exchanges. He thus adapts the theoretical course to the real needs of the learners and diffuses the contents by distant learning. Finally, learners are invited to write, at the training center, a text in French linked to their needs and future experiences (for example a future discussion in the bakery or a document to demand their visa). This deductive approach allows them to apply the rules of grammar while producing knowledge. They thus integrate the formal rules through a production that prepares them for their future experiences. These last two stages make use of the

deductive method, as the learner passes from the general rule to the written one or the application of the rule in his singular situation. He becomes an author by putting into perspective the content of the training (intentionality).

Finally, the loop begins again and the learners find themselves in a new situation, readjust the learned rules that have will become new habits, while making new abductive hypothesis and transductive uses of the French language.

At least two types of alternation are distinguished in these studies : an alternation between daily life (practice) and training center (theory) and an alternation between distance training via the digital platform and face-to-face training. Indeed, the first step that takes place in everyday life and therefore away from school, alternates with the second step of analysis of practices and problematization that takes place in the training center. Followed by the third step, which takes place in distance, with the communication of theoretical elements, such as documents or short videos that respond to the learners' preoccupations by explaining the formal rules (grammar, syntax, vocabulary...). Finally we favor the writing of a text in face-to-face class even if it is an individual activity, as it requires more effort from the learner than the simple application of the rules. An « enabling » environment [33] as well as individual support and collective exchanges can be proposed in a training center. We now propose a general model for the organization of a flipped classroom in adult's education, based on our study on the learning of the French language in France, Kolb's cycle, Lebrun's researches on blended learning and Denoyel' researches in pragmatics :

Figure 3. *The pragmatic of the three reasons in a blended learning*



5. CONCLUSION

In our example of blended learning for immigrants in France, we pointed out the primacy of inferential logic. In this pedagogical method, adaptable in any adult training, the principle is to take into account the experience of the adult in order to transform it into a learning experience. Thereby, we exclude the didactic logic based on references as in type 1 flipped classroom. The spatial-temporal dichotomy that characterizes blended learning: teach in distance, learn in class, denies learning from experience. The articulation of Denoyel's theory allows us to go beyond this dichotomy between theory and practice, distance and presence. According to Piaget, practical success often proceeds the

conceptualization: to succeed is to « understand in action » and to understand is « to succeed in thought ». The semiotics of Peirce, the three reasons of Denoyel as well as our research on the pedagogy of alternative training, allowed us to conceptualize an adapted form of flipped classrooms in adults' education. How can we use new technology in order to place the experience of the learner at the center of the learning process, and not just for transmitting learning contents, is the question to which this article hopes to contribute. We continue the verification of this spatial-temporal alternation proposed above, by empirical studies carried out in the context of our thesis.

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