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Cognitive Discourse Reformulation Leads to the Development of the Competence of the Students: Case of the School Jean Piaget Students

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Abstract

This article is aimed at analyzing the explanatory speech during lessons, in which the explanation of the teacher is a cognitive development Co-built in order to help with the comprehension of new elements given to the learners. We will analyze precisely how the explanation within a teaching-training is articulated during the course. We will present the methodology of observation of these classes as well as the teaching course of the meetings of course; but also how teachers proceed to explain the complex contained in the courses? What is an explanatory speech? How to identify the lexicon difficult to understand for one learning? And which words or expressions do teacher really explain in this interaction? This research highlights how this reformulation leads the teacher to apprehend the difficulties of comprehension. He uses new means to lead the pupils to become aware of the representations in its cognitive speech to see itself adapting the contents of teaching for a successful training that positively influence its competence.

Keywords: Expertise, Speech cognitive, Pedagogy differentiated, Taking of consciousness, Representation, Metacognition.

Contents

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1. Introduction

The idea of the competency of a person in situation could be [1] *« that of the competency that is enforced by a person in situation, in a given context of a diversified but coordinate resources set. This enforcement is based on the choice, the mobilization and organization of these resources and also on the relevant actions they allow for a succeeded situation treatment. »*

However the individual do not develop alone. The environment and culture contribute in a crucial way. During the lesson, the students try to decode the meaning of the teachers words following his questions. They try to have the right behavior and such a « game » impact the classroom environment and the general dynamics of activities. To find the expected meaning of words, they must not be confused. On the other side, some students fail to insert in the cognitive structures the given information's. Whether they are verbal, para verbal (change of tone, rhythm) or non verbal (use of gestures, pictures, mimics), used separately or associated, the explanatory technics in context represent a range of pedagogical practice likely to favor the acquisition of lexical knowledge by the students. And it is their organization in the interactional speech which explains the teacher's various practices. However, is the explanatory speech always adapted to the students and the classroom situation? That question raise *« the notion of the cognitive management of the explanation understanding by the understand or »* [2]. The teaching speech evaluation frequently goes through the evaluation of the students' knowledge. .

You have to reformulate is an attempt to conserve the meaning as far as « the scientific language is considered as a functional communicative tool, shaped according to the particular requirements and constraints of a given subject » [3]. He continue saying that language has a remarkable semantic precision and each concept or notion has only one name and reciprocally each word correspond to only one thing.

Teaching is to verbalize scientific concepts, that is to say, suggest a semantic equivalency between a word and its reformulation. Besides reformulation you have to think about the questioning method that the teacher should make known by his students. It is the teacher who has got the keys in order to stop or continue the interview because he has got a concern : not to exceed the limits of the dialogue with the student. For him it is better to stop than willing to pursue and risk to turn round and lose the quality of the exchange. At the end of the exchange, it is desirable that the learner keeps the essential part of the interview. For that, the teacher will help the student to synthesize, to reformulate key points, the main points in order to better memorize the whole. The domain of the speech transformation study the structures, the models, the mental representation and the processes that underlie the written or spoken discourse. It is a multidisciplinary domain which include psychology, rhetoric's, sociolinguistics, discourse analysis, education, sociology, anthropology, computational linguistics and data processing.

The researchers in discourse analysis have identified a certain number of mechanism which favor learning. The aim of the mission on the field this to improve the comprehension and production of the words in textbooks, tutorial sessions, classrooms, computer based formation and other training environments. Basing mainly on the cognitive mechanism, it is clear that cognitive, social, affective and cultural foundations are narrowly imtricated in contemporary discourse analysis theories.

Indeed, the teacher we have chosen has the special feature of having anterior knowledge that Vygotski could enter in what he called the daily language. So the explanatory speech of the teacher is based on the gathering of certain knowledge in order to transform or complete them. From that moment on, the explanatory speech is not only imposed in the classroom but co-built in interaction [4] from what the teacher presents as being important to understand and memorize, from the knowledge already built by learners. Researchers are very interested in the development of the explanation to the children [5, 6] but that of the teacher is difficult to determine. Some have also studied the development of knowledge of the new learner [7-9] but studies on a more advanced subjects are lesser. Indeed, those researchers do not integrate the particularity to consider the learner as having a linguistic pass (cultural, social, etc.). In our scientific context the teacher and his teaching method [8]inform about how the learner give meaning in situation.

Thus the teacher reformulates the information given orally to recall has just been said and to potentially create meaning for students. The explanatory discourse then organizes the progress of a knowledge, progress elaborated according to the teacher's representations on the object and the interpretation level of the student during the cognitive activity of comprehension. Therein the explanatory speech regulates the speech, identify the period of incomprehension but also try to build the social reality.

Discourse acts are made in such a way that is sensible to the mass (sharing of knowledge) among the participant to the speech. The cognitive representation of an oral utterance can be very complex when there are many communication channels among the participant to a conversation. Teachers generally ask students to recall the explicit content or to answer to multiple choice questions that the acknowledgement of words, concept definitions or adjectives. A way of promoting the deep comprehension is to compose exams with questions focusing on the model of the situation, deductions, reasoning and other aspects deeper levels. Coherence is assured both in and between the representation levels when comprehension happens.

« The cognitive analysis » of discourse, however, is not the same than that of a psychological treatment of discourse. The psychological analysis concentrates on the structures and the mental representation process. Thus, the cognitive analysis won't measure the reading or the reaction time, or other psychologist of the method used to test their hypotheses. The cognitive analysis is centered on the discourse and it's structures, but draw it's words from the discourse analysis theory. *Thus a cognitive analysis is an analysis of the discourse properties which are counted in terms of cognitive concepts, such as various types of mental representation.* In fact, there are discourse structures which are generally recognize as discourse properties, but are generally defined in cognitive terms such as metaphors, subjects or general themes, coherence, presupposition, pertinence. Finally, all the discourse signification and discourse transformation are based on knowledge, but knowledge is not linguistic but cognitive. In other word, most of discourse interesting properties demand a cognitive analysis. The explanatory discourse is a way of transmission [10] and access to knowledge [11] essential in educational context. In what extent the explanatory

discourse of the teacher, the reformulation help him to convey his message ? Is reformulation an attempt of meaning preservation ? Is the scientific language considered a functional communication tool in reformulation ?

Our hypothesis is the cognitive discourse reformulation of the tutor cause the student's competency development.

2. Methodology

2.1. Experimental Technique

We are going to make students of second and third form of the school JEAN PIAGET integrate in their cognitive structure the information's present to them and above all help them to reformulate concepts. They are 55 to 58 students. We are going to compare the reformulation procedure used by the teacher in his oral discourse and in a written one and check if the learners' develop competency.

2.2. Observations Analysis

The data collected through these interviews are the point of view of the interviewed about cognition (point of view concerning the experience and the representation one is expecting the learner to acquire). What is important is the place of the subject's words. The meaning given by the subject to learning of the experimental demarche, its acts, state of mind but also the goals, the representations that impact his way learning. Piagetian interviews aimed at describing the construction of knowledge and the consideration of an epistemic subject. That description has been elaborated from the point of view of an external observer, even if it requires the interview technique. The clinical method use the subject's replies not to get the subjective point of view of the subject but to observe (from an external point of view to subject-learner) the cognition working. It is in this approach « in third person » through the accumulation of particular cases that the general has been built.

To say the contrary of that definition, some authors suggest a new definition saying that it is : *« any technique allowing to infer identifying objectively and systematically the specified features of the message ».*

Finally, for Quivy and Van [12] the content analysis is the choice of the words used by the speaker, their arrangement frequency, the construction of the discourse and its development constitute information sources through which the researcher try to build a knowledge.

The research lean on the data collected in a dialogue centered on the subject, and which we think *« that the words exchanged following a confidence contract, that testimonies(…), on what a subject do or think are essential source of analysis »* (p.35). the goal is to *«seize the subjective meaning of non instrumental activities and the way seizing them objectively. »*(p.34). The analysis will consist in *« discovering, elaborating gradually a set of concepts, of properties and relations deep rooting in the data collected »* [13]. The analysis will try to find in the discourse of the interviewed what they bring as information concerning the learning management and to classify the information in such a way that new elements can emerge. The second aspect of the research will consist, during the trial to describe which way learners proceed? What do they do ? What are the process included ? How to list and describe learners ? How are we going to evaluate them compared to the learners' potential of learning?

3. Results

3.1. Result Concerning Reformulation as Cognitive Discourse Analysis Tool

Reading comprehension

The question is to use for the lesson on reading comprehension ones impressions to formulate hypothesis, determine the results to lead us to the analysis and interpretations.

The class four is a second form class of 58 students.

3.1.1. Theme: Methodical Reading

The majority of the students take their textbook in which it is written : date-lesson1-session1.

In I. I use the paratext element to present my text : title-author-book-edition.

In II. I use my reading impressions, the text nature and tonality to formulate the general hypothesis.

In III. I use the reading element to check the general hypothesis with the reading axis 1 followed by the double entry table including : entry-result-analysis-interpretation…

They fill the textbook and follow the methodical reading.

The teaching strategies of the teacher and the means he uses to capture and maintain students attention seem to be a mean to maintain them attentive. While the teacher is writing on the board, some students make noise, others follow what she is writing. The learning situation : with his parent a student of 5ème 2 learned about the importance of sharing. Or read the situation in the board… She asks a student to read the learning situation.

Student : with his parent, a student of 5ème 2 learned about the importance of sharing

We are going to study in methodical reading. What will the text deal with ?

Many students raised their hand and one of the mist given the floor. He said :

Student : the text will be about the importance of sharing

Ok the text will deal with the importance of sharing as your friend said

During a short moment, one throws a pen to another on a neighboring table. The teacher continues her lesson because she did not see the perturbation act that just happened.

It is a sharing situation. Take your books on page 28 and 29. What is it about ? A student is asked.

Student : it is about a generous saleswoman

Student : it is about a pious saleswoman

Student : it is about a muslim saleswoman

From what we just read, who can present the book ?

Student : the text is about a generous saleswoman, the author is Ahmadou Kourouma, and the book is the novel « le soleil des independance » edited by the seuil edition.

Seuil edition. From the presentation we have just done, what is the text about ? What can we say ultimately … Some students raise their hand and a girl is given the floor.

Noella ?

Salimata is a very pious muslim but despite her prayers, Allah has never given her a child

From the title and the presentation done by Noella, what are we going to talk about ?

Student : muslim saleswoman…

A muslim saleswoman… another answer ?

A very pious saleswoman

A very pious saleswoman

Konaté ?

A generous saleswoman

A generous saleswoman. We have our reading first impression. Now read silently the text…

The comprehension which results from the reading is always the fruit of the interaction of two essential component because a text that has its own features (lexicon, structure, syntax) and a reader with his own features (expertise, goal, intentions).

3.2. Result Concerning the Reformulation as conscience Tool

Here, we are concerned with the uses and the comprehension of words that the learner makes : it is the meaning negotiation.

The class 3 is a second form class of 57 students.

3.2.1. The Theme Chosen is the Cockroaches Preferendum Trial

The factors which influence the behavior of cockroaches are:

- light
- temperature
- humidity
- nature of the soil

From the teacher's questions, the learner should give the sub problems or the following hypothesis to separate the factors:

- Sub problem 1

Do cockroaches prefer humid or dry places?

- Sub problem 2

Do cockroach prefer heat or cold?

- Sub problem 3

Do cockroaches prefer light or darkness?

The determination of a cockroach feature is made through an experimental method. A real experimental method separates the factors intervening and helps vary only one factor at the time.

The realization of the experience by the learner passes through the previous determination of the experiment principle and the enouncement of the experimental device.

The learning material is composed of:

- Empty bottle of water AWA
- Thermometers
- Melting ice
- Hot water
- 10 cockroaches
- Lightening device 40 watts bulbs or a torch

A biology teacher is responsible for the class: So it is there he is going to deal with the class?

Student: yes, it is there he will go! So my conclusion is that the cockroach cannot stay in a very dry place, they like wet places.

Teacher: now, you want to make an experiment to show that cockroaches like heat. If cockroaches like heat, what does this mean?

Student: they don't like coolness

They don't like coolness, they don't like cold, so if you are asked to show by an experiment that cockroaches like hot places where there is heat than places where there is cold, what will you do?

I will take the case of our toilet to do the experiment the day I brought the cockroaches. I will do the experiment ok! In the case of our bathroom, we have a small door here and at night we close it. The day you asked us the cockroaches, during the day I looked for them but I could not find any. But when we closed the door, because we have an air conditioner and the heat goes in the bathroom, the heat goes directly in the bathroom and it is hot, at night I sat down …

When do you put the air conditioner on?

At night

It is the night is produces heat

Yes! Our air conditioner is installed in a way it can liberate heat. I stopped and said ah! My teacher asked to bring cockroaches and since I am not finding any. So let's try at night. It is why I waited and I saw many cockroaches entering the bathroom. I said ah! My younger as they entered, let's take our bottles to put them in; it is this way I noticed that cockroaches don't like heat.

Cockroaches don't like heat, now in the laboratory here, you are going to show us that cockroaches don't like coolness and like heat!

I am going to take a small place, a place like that , very hot: the hot air is in the bowl for a long time, there is no window, nothing.

Did you closed all? Yes?

I closed everything. I made a small hole so that it passes directly to the other bowl. So it cannot receive air. It is closed. If for example I take a cockroach and put it in a place where there is coolness and I precise, where there is the bowl, there is heat. I am going to make a hole…

You have this vessel, you will heat in one side and coolness in the other. How will you manage to have coolness where there is coolness at the place where you want only coolness?

If it is closed I will try to have a limit (he puts a limit in the center)

A sin the first experiment and in this side (on the left) that air can go from down to top…

The air can go from down to top but can you use it to put coolness so that it is cold?

I will find ice

Ice, good!

I put the ice under the right side and it will be very cold, as it is rubber, the bottom will be cold. We are to put a cockroach in it and it will try to find a place where it is hot. As I have limited, the air cannot go outside and it will be very hot and through the hole I made it will try to get to the place where is hot. So I can say that cockroaches like hot places.

From the beginning they conceive the real as the product of diverse factors. Those various factors will have a sort of possible combination set. From that moment on, we will have the hypothesis that will consist in rebuilding those combinations and establish experiment conformity links.

For Britt-Mari [14] the use and comprehension of words require from the intermediary and the learner a meaning negotiation: it is the conceptual contract. The conceptual contract is the cognitive procedure clarification. During these sessions, the subjects are expected to abstract the stem observed, the variables intervening in the flexibility. However, those understand it as far as the existing cognitive is in accordance with what is proposed to them. [14]

3.3. Result Concerning Reformulation as a Tool Favoring Learner's Representation

Research in education has shown in what extent student's representations about the knowledge which they receive resist to the teacher's efforts and it is what bring about learning difficulties. For example in the following case where it is question to describe experimental conditions preferred by cockroaches, the students' answers are these :

The class 8 is a third form of 55 students.

3.3.1. The Chosen Theme is the Cockroaches Preferendum Trial

If you are asked to realize an experiment to show that cockroaches prefer dark places, what will you do?

I will choose two places.

How will be these place ?

One will be lighted and the other not.

If you have to do this experiment in the classroom how will you do it?

I will take a box with one side closed and one opened.

If the other side is opened what is the risk concerning cockroaches ?

They will escape.

How will you have a closed and lighted place ?

I don't know.

The other side can also be closed but we are going to enlighten it with a bulb.

How will you experiment ?

I put five cockroaches in the dark place and five in the lighted place and I will observe. I think they will feel at ease in the dark place.

What will you do to show that cockroaches prefer dark places ?

I take a tin that will be close. It will be dark inside.

When will you put the cockroaches ?

I will put them before closing.

If you confine them such a way, what are the risk for the cockroaches ?

They will die.

Students have pre existing conceptions to teaching and they impact the concepts in biology. For some subjects, the conclusion of the experiment is based on the fact that cockroaches died or stayed alive. The conclusion, i.e the deduction does not concern the variable which arouse the experiment but the cockroaches survival aptitude. For them, the experiment is good when the cockroaches survive and not good when they die. Mainly the reasoning lies on the connexions previously experimented, the links between causes and effects which show the living and adaptation condition.

For this subject and many others, there are problems concerning the abator aspect of the experiment mainly when you have to reduce it for experiment in laboratory. They don't succeed in miniaturizing the elements intervening in the experiment. The subject don't take into account all the possible sort of situation which will give them means by which they will succeed in the experiment. For them miniaturizing is limited to the fact of opening a window during the experiment, for others, we pour water in a place or put cockroaches near a window or we put them in a pathway or …

Where do cockroaches live ?

In dirty places, places where there is rubbish. In wet places.
They are dark places too. If you are asked to show that they live there because of darkness, how will you show that ?
I will put the light off and I will put take some papers to close the holes through which light ray come in the classroom. The place should be dirty and humid too.
Why do you want the place to be dirty ?
Because cockroaches like humid places.
Do you to show that they like darkness or humidity together or it is because of darkness ?
Because of darkness.
How many places are you going to consider ?
Two places
How will you have the two places ?
In the first experiment i close the windows to check if they like darkness and in the second I open the windows to check if they like light.
How will you know ?
Don't answer
.... where did you catch the cockroaches ?
The place where there are many papers and dirty water.
In dirty water or wet places. If I want to show that cockroaches prefer wet places, what place will I consider ?
A wet place.
How will you do ?
I will pour water in a dark place.
Why do you pour water in a dark place ?
No answer
What do you have to choose between darkness and water ?
No answer.

We notice that the subjects in their « experiments » include their own strategy and cognitive repertoire. The students strategy is mainly consist in trying to conciliate the material and the human history they conceive and which is part of their cognitive environment. But when we are interpreting the experiment, it does not correspond to the scientific point of view.

De Vecchi and Giordan [15] affirm that *« these representation pre exist and tend to accompany learning in a diachronic way…and more than that.* The student come in the classroom with some knowledge « gathered » either out of school or during previous school activities.

With Piaget and Bachelard , the stress is on the idea of a conceptual structure to transform, on the obstacle to overcome in order to succeed and on the slowness of the process. Piaget describes schemes whose unbalance lead to the increase balance where Bachelard is more radically insisting on the necessity of a mental break .It is the student who learn through the representations mentally available and nobody is going to replace him in this process. Learning lies on an implacable paradox for the learner, because knowledge doesn't come according to his interest or needs but break his representations.

The students had previous conception to the teaching and it affected the biological concept. For some subjects, the conclusion of the experiment was based on the fact that cockroaches died or survived.

The deduction was not about the variable which required the experiment, but on the cockroaches capability to survive. The experiment was convincing if the cockroaches survived. Such a conception from the students correspond to a functional system of explanation and their interpretation of the world, their environment and their own body.

With the intention of efficiency teachers adapt their teaching on points such as the cut-out and the presentation of knowledge, the session rhythm, type of animation … in almost all the classes even the most strong , we can have completely lost students.

It is implacable gears which tend to abandon some students who are lost and are in difficulties. Annual curriculum are partially seen and that worsen the situation for the next classes. The sessions take place in half class for two successive hours. At the beginning of the class the teacher distributes worksheets. The exercise is explained to them after the distribution and students start working immediately. Those who have difficulties stand up to ask for explanations that will help them. The good students do the exercises without caring for the others. The monitored class session help students work at their own pace. You have to make sure that students have a certain autonomy.

4. Discussions and Conclusion

4.1. First Secondary Hypothesis According To Which Cognitive Discourse Process Are an Analysis Tool for Learners

An objective is a sort of goal to reach, considering that a course objective determines the teaching the has to conduct, and make the students understand the lesson, an objective can be defined as a communication of intention describing what is expected from the person to whom the objective is meant. The objective can be general or particular. When it is a particular operational objective, it describe an observable and measurable behavior and the the verbs used for formulating these objectives are verbs of action. The verb used to express an objective is very important in so far as it is used to verbalize the goal to reach. For formulating a particular operational objective must obey the three Major tools which consist in describing the expected behavior, describing the necessary conditions to the behavior and describing the performance criteria.

The learner must master the language however the language is not only based on the words or sentences or meaning but also a wide range of knowledge which is not predicted by the text but by the representation of a good language user.

Teachers generally follow a programme script that cover definitions, facts, concepts, concepts attributes and examples. This content is at a lower level than Bloom's cognitive objective taxonomy. Teachers rarely try to encourage higher inference, synthesis ,integration levels and knowledge application to Blooms practical problems. Bloom's taxonomy [16] (1956) classify learning objectives into 6 families which go from the most simple learning operation (babase of the pyramid) to the most complex (top of the pyramid). A action verb set correspond to each level. Those verbs help to identify precisely a learning objective but to state more clearly the learning objective of your own activity in terms of « capability to ». some mechanism need to be followed for a deep comprehension of the discourse :

- explanation construction through questions, contest learner's beliefs and knowledge and tutorial system.
- encourage students to ask and answer questions including deep reasoning to help them construct explanation. When students are trained how to ask good questions during reading or listening conferences, their comprehension level increase on objective tests [17].
- One of the best way to make students ask questions is to contest one of their most established belief, and thus cognitively unbalancing them. This students will be stimulated by a great number of question and opposite arguments. Research have proved that questioning help find real research question through contradictions, incompatibilities, obstacles to goals, prominent contrast, uncertainties and clear knowledge lacunas. Consequently, a way of arousing questions from students is to create a cognitive unbalance and give useful information when they ask questions.

This reformulation in his own language will offer his co-speaker further comprehension experience than if we were in a traditional classroom situation. This advantage cannot be entirely attributed to the possibility that tutors are more pedagogical expert than teachers. Peers sometimes do a very excellent work that help tutors. Normal tutors rarely use sophisticated pedagogical strategies such as the approach of Socratic going from previous conditions, error diagnosis and correction or modeling the scaffolding. These discourse model in normal educational support explain the advantages of tutorial system in the classroom. Educational support focus on the joint settlement of problems, asking and answering questions, and reinforcing the explanation in particular problem contexts.

4.2. Second Hypothesis According To Which Cognitive Discourse Is a Tool Favoring Students' Awareness

Awareness is the dynamic process permitting to go from a lower knowledge, cognitive and conscious level to a higher one. It is characterized by the passage from implicit to explicit.

From that moment on there is an awareness, an explicit knowledge, i.e. as soon as there is *« know how to do »*, there is metacognition since there is thinking about cognition. On the other hand when the awareness concern a scholarly knowledge for example about the functioning of the brain in general or what is evocation, it seems that there is no metacognition. The student doesn't think here about his way of thinking. Being aware of his way of thinking help the student know among others his cognitive and metacognitive activities and the knowledge supporting these activities.

Christmas [18] noted that the different studies on metacognition could be grouped in nine categories according to the metacognition objects and modalities. To step forward with metacognition, it seems to be important that the classroom activities be determined by objectives which will be help the student construct the mental tool needed to learn. The learner these tool to go forward. In one word the answer to the question of the classroom activities- whatever the student level, whatever the knowledge to teach- pass through a prior thinking : the efficiency of the activities depends on the mental tools previously suitable. It seem to be necessary that the classroom activity don't ignore the fundamental role of these competency which constitute the lever to learning. The classroom activities objectives should be to understand the necessity to master it in order to succeed.

First when he is learning, the student use less conscious method, more or less efficient. That make us think to the experimental method , mainly to the handling dimension. This method will arouse questioning from the students. Through his interaction with the teacher, the student will meet different point of view.

Then the awareness will constitute a source of the scientific learning for the student. So it is necessary to understand representation in the objective and their change with the awareness. Finally the work of logical capacities and the mastering of the reasoning types of learners are facts that inspired us. The learner needs to acquire cognitive tools that will help him know the world. Teachers in general reproach students *"not to think"* or *"not to be attentive"*[19]

Actually children don't know how to mobilize strategies to learn new notions. For example to tackle a new problematic, the student needs someone to help him to find *"a thinking method"*. This way, the student will be aware of his mental strategies and will learn to mobilize voluntarily *"his intellectual tools"* in the long run. The teacher can help the students mobilize their intellectual capacity providing that he makes them aware of the learning strategies that will help them construct the knowledge. It is for that the teacher helps the student by giving those exercises for example succeeding multiplication or well preparing a dictation. When he teaches the students English preterit rules, he draws the students' attention on the object that consists in mastering the preterit, its rules and properties. This favor's the construction of cognitive tools and the learner will mentally or psychologically adopt consciously or unconsciously a repertoire of strategies that are available. The aim is to know the most efficient strategy.

Concerning problem solving it is to do something with the data given. It is to make a representation with the results, know the reasoning and the actions to take, i.e. the different steps of a problem solving ; but interms of knowledge of the action of learning, it is necessary to adopt a mind favorable to learning., type the data, analyze them, memorize them in order to reach the final goal.

4.3. Third Secondary Hypothesis according To Which the Cognitive Discourse is a Discourse Favoring Student's Representations

In the specific case of learning the experimental method, the construction of knowledge by the subject will take place taking into account the goals and the results to reach. Then by the acknowledgement of the means used, the reason of their choice, that will help to the comprehension of the object and the conceptualization of knowledge. The experimental method goal is to objectively apprehend a given reality and is based on the emission of hypothesis which is a logical scientific proposition coming from imagination.

Thus the piagetian conception contributed to make thinking flexible, the understanding of the applying of the experimental method by the subjects. Unfortunately, despite this advance, there some limits to this method which neglect the fact that the subject handle the symbolic information, so interpret them. Now analyzing the information start by the identification of the different situations and their analysis. This introduce the notion of representation.

In fact, applying the experimental method call for a represented model ; i.e. internal organization of the content ; in other word, a representation and not as a construction process of the logical structures only. In this logic, the representations are our basic knowledge, serving for the acknowledgement , the comprehension situations and action. They are provisional steps of knowledge, of reusable and stabilized knowledge coming from our meaning construction activities and interpretation of situation and events [20].

Other approach will dwell on the strategies the learner need to mobilize in order to transfer hem in situations including action, i.e. experimentation from a model representation.

The representation is fact of having action and that action must be internalize. But the experimental method i.e. sis a strategical method for the young learner. This strategical method aims at knowing a given reality.

In researches on representations, other approaches will insist on the strategies the learners need to mobilize in order to transfer hem in situation including action, i.e. experimentation from a representation model. The model must be internalized because it constitute what we call the development of the operatory though.

In is research on the experimental attitude, and the inductive reasoning, Inhelder, et al. [21] explicitly pose the functional intelligence problems : how will a child use intellectual tools, mental notions in the situations he will have to experiment them ?

The help given to the learner consist in making him understand the meaning of his action, find what he can do, find the causes of this success. It consist of being aware of the method to use, find the errors, analyze them in order to correct them. We need to talk about authors who insisted on the cognitive conflict in the understanding of new concepts and the importance of the situation in their release. We can cite Ackermann-Valladao [22]; Border [23] and Tape [24].

Ackermann-Valladao [22] deals with the characterization of the « functional status of representation in finalized behavior from the child ». he poses the problematic of knowledge functioning for children in particular problem solving situation. Any problem solving calls for a complementary action and representation. There is an internal dialogue of mental representation that will be mentioned by the subjects and can be qualified as the inadequateness face to the knowledge that the activity requires. In this case some readjustment of actions can happen to lead to success. The subject want to act and modify his actions *« to see »*. the effects noticed will help him to evaluate and modify his actions in order to succeed.

For Border [23] the experimental problem solving concerning fire, the non equal container and the change of order nased on the assimilation of the familiar scheme to the problem i.e. the intervention of the familiar scheme in the definition of a situation in the case there is a gap. The overtaking of this cognitive conflict lies in the integration of new information's to the reasoning of the subject, so to a new exploration of the situation.

To finish, in the approach of Tape [24] it is to *« understand the experimental reasoning formation conditions, because for him, the construction of the model implies the previous knowledge according to which the teenager express orally a set of hypothesis »* and propose the verification means.

The main ideas which come from the experimental reasoning study in African context allow us to say that both the experimental reasoning and the experienced reasoning come from the hypothetic-deductive method but differ by the analysis method of the object. One analyses by dissociating the factors and the by a global approach congruent to nature. Tape [24] shows the plurality of representations, variety of cognitive development according to the cultural space, so the plurality of intelligence forms in the mastering of the experimental reasoning.

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