

## **FROM ERROR TO LEARNING, AN ITERATIVE PRACTICUM**

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### **Abstract**

The aim of this paper was to consider reflexively about the error and mistake as a hinge of learning, appreciated from the iterative relationship. In this case the iterativity arises as a recurring and dynamic present in the work of learning environments act. The work was presented under the Doctoral Forum of the Faculty of Education at the University of Carabobo entitled *Knowledge Problem Defining: Cognitive Conflict in the Production of Knowledge*. Since vision of this presentation, it is considered the process from error - learning pass both or they walk together side by side, cognitive aspects and teaching, with its implications, in addition to its recursion from an integrated approach, since an error variability exists by participants, which should be valued, contextualized and handled, as it is implicit in the production of knowledge focused in a positive way.

**Keywords:** Error, learning, iterativity, knowledge, pedagogy.

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## **DEL ERROR AL APRENDIZAJE, UN PRACTICUM ITERATIVO**

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### **Resumen**

El objetivo de esta ponencia fue reflexionar acerca del error como elemento articulador del aprendizaje, apreciado desde la relación iterativa. En este caso la iteratividad se plantea como un acto recurrente y dinámico presente en el quehacer de los ambientes de aprendizaje. El trabajo fue presentado en el marco del Foro Doctoral de la Facultad de Educación de la Universidad de Carabobo titulado: *Problematización del Conocimiento: Conflicto Cognitivo en la Producción del Conocimiento*. Se considera que en el proceso del error - aprendizaje transitan aspectos tanto cognitivos como pedagógicos, con sus implicancias, además de su recursividad desde una postura integradora, toda vez que existe una variabilidad del error por parte de los participantes que debe ser valorado, contextualizado y manejado, puesto que está implícito en la producción de saberes.

**Palabras clave:** Error, aprendizaje, iteratividad, conocimiento, pedagogía.

Ponencia presentada en Foro Doctoral de la Facultad de Educación de la Universidad de Carabobo titulado: *Problematización del Conocimiento: Conflicto Cognitivo en la Producción del Conocimiento*. Diciembre 2015.

## **In order to reflect and argue**

The pedagogical educational process, traditionally, does not include the error as part of teaching and learning strategies despite of being present at all academic levels. So many questions about it can start such as: Why is not mistake considered as part of learning? How to handle the error in the class? Should student always be penalized because of error? Does the error have no place in know-how learning environments? How is the error treated in the construction of a thesis? These among other long list might arise.

Hence, this topic is suitable as an object of analysis on the critical problem of knowledge. We can get conflicting positions between declarative with experiential regarding the error as an intrinsic element in understanding, the relations arising in this environment of situational - communicational exchange among apprentices partner, where the error is spontaneous and unique; it can happen in a singular way and it is propitious to the acquisition of new knowledge. In a study of Tjosvold, Yu and Hui (2004) the following is required: "Learning can take place when one acquires knowledge that one previously did not possess, an important source of learning is from mistakes and errors)" (p. 1224). On the other hand, Morin (1999) expresses in his work "*Seven complex lessons in education for the future*":

Education should show that there is no learning which is not to some extent vulnerable to error and illusion. Information theory shows that the risk of error from random perturbations or "noise" is inherent in all transmission of information, all communication of messages. (p. 5)

Consistent with previous authors, De la Torre (2004) states in this regard: "The error is a concomitant variable to the educational process, because it is not possible to advance a long unerringly unknown way... no error-free learning "(p. 33). From the above it follows that learning involves a dynamic process, that will not stop and which errors are implicit. It is precisely from this point of view to study the potential error in the pedagogical action which is analogous to the learning process.

Moreover, it would be unserious assert that the error in teaching environments learning is a habitual action associated with the synonym usual, i.e. error does not arise because

participants choose to do so behaviorally or systematically, however if it can be iterative, since it tends to repeat itself, it is frequent and the possibility that mistakes again at any time. It is plausible, then takes the difference between habitual and iterativity from the perspective of Rifón (1994): "The iterativity designates the repetition of an action once, the habitual means the repetition of an action at different times ... is repeated discontinuously." (p. 185).

Although these words seem like they are different, but transcendental in the practicum. According to Shön (1992) the practicum is a reflection through action and action, action will vary according to context, different times and situations. For Gonzalez and Fuentes (2011) practicum is:

A privileged space to analyze the knowledge and teaching: for reflection on what and how teachers know; how and who builds, it systematizes and disseminates knowledge from practice and, ultimately, what guidance would be most relevant to learning processes and training to be effective. (P. 49)

The author of this paper assumes, in this case, as a participatory practice, in conducting a continuous process in a situational reflective to where it is used and applied learning. The facilitator (teacher/professor) provides practical guidance without becoming a general recipe, since students or participants are unique and are not wrong in the same way or necessarily always make the same mistake, for example, Shön position (Ibid.) believes that error once detected and corrected it involves action strategies and changes in knowledge, making the error - correction as a circle (loop) learning.

It should be noted and argue that in accordance with Shön this dynamic happens in any learning environment and at any level from kindergarten through 5th. Level studies as well as workspaces. This reality, usually, in many cases it is also rejected by some teachers. For this reason, we must not forget that learning and knowledge are not immutable, passing through the continuity of construction processes and reconstructive with cognitive or complementary intra-subject / subject-object interactions conflicts. In this regard, I quote Garcia (2000) who exposes regarding the construction of knowledge the following:

Knowledge development is an ongoing process ... there must have continuity between biological processes and actions ... Knowledge emerges in the process of organizing the interactions between a subject ("subject

knowledge") and that part of reality constituted by objects ("the object of knowledge") (p. 60-61)

This approach invites us to reflect on the singular effort of the individual to generate ideas and be willing to internalize knowledge and then in an inter dynamic of sharing with one another, act on reality and go develop schemes to function in future actions and different contexts.

Error and learning are approached from the cognitive and pedagogical, since in learning environments inconsistencies or discrepancies, conceptions that conflicts arise, originate unlearning to giving place to relearning and so the genesis of new knowledge begins. These intra cognitive conflicts are characterized by a divergence between internal cognitive elements of the student, their perceptions, their ideas, their epistemological or cognitive demands (Hewson, 1985) and, in general, their conceptual ecology (Posner et al., 1982; Strike and Posner, 1992). (In Villani and Orquiza de Carvalho, 1995). Everything stated above is, administers, manages, studied or considered from the pedagogical and didactic vision.

Also, when misconceptions are evident in classroom activities, practices, laboratories, consulting thesis, for example, the teacher tends to consider that there is a critical factor operative, distorted the concept, however; Tamayo (2002) in its opinion that a misconception is not necessarily explicit representation, which is the student of a fact or information that is or may be acceptable to solve your problem without explanatory level; evolving as new knowledge is built.

But what can be done about it, what happens, how the connection between a misconception and concept, this and other concerns emerge interweaves, however a cognitive structural coupling that seeks to associate, reason, experience, always occurs when the facilitator give the opportunity to the student. In this regard, Resnick and Klopfer (1989) consider that before that knowledge is generative to interpret new situations, thinking, reasoning, learning, students must question, doubt, examine the new situation and build new

knowledge structures. Popper had a very similar position, he invites us to let students ask and question instead of saturating information.

According to the above stated, Beauport and Diaz (2008) emphasize and consider the following: "Making connections type sequence, logical and precise, in contrast to the associative process that encourages us to do more general connections, relationships and random, detailed to reach a conclusion. [Cause / effect / question / reflection / comprehension or understanding] "(p.45 - 46)

This generates a rearrangement of ideas or certain knowledge or misunderstandings. Furthermore, according to this, the relationship emphasizes Schank (2012) who suggested cognitive processes that underlie all learning shown, which are:

#### *Conceptual Processes*

1. **Prediction:** Making a prediction about the outcome of actions
2. **Modeling:** Building a conscious model of a process
3. **Experimentation:** Finding out for oneself what works and what doesn't
4. **Evaluation:** Improving our ability to determine the value of something on many different dimensions

#### *Analytic Processes*

5. **Diagnosis:** Making a diagnosis of a complex situation by identifying relevant factors and seeking causal explanations
6. **Planning:** Learning to plan and do needs analysis as well as acquiring a conscious and subconscious understanding of what goals are satisfied by what plans
7. **Causation:** Detecting what has caused a sequence of events to occur by relying upon a case base of previous knowledge of similar situations
8. **Judgment:** Making an objective judgment

#### *Social Processes*

9. **Influence:** Understanding how others respond to your requests and recognizing consciously and unconsciously how to improve the process

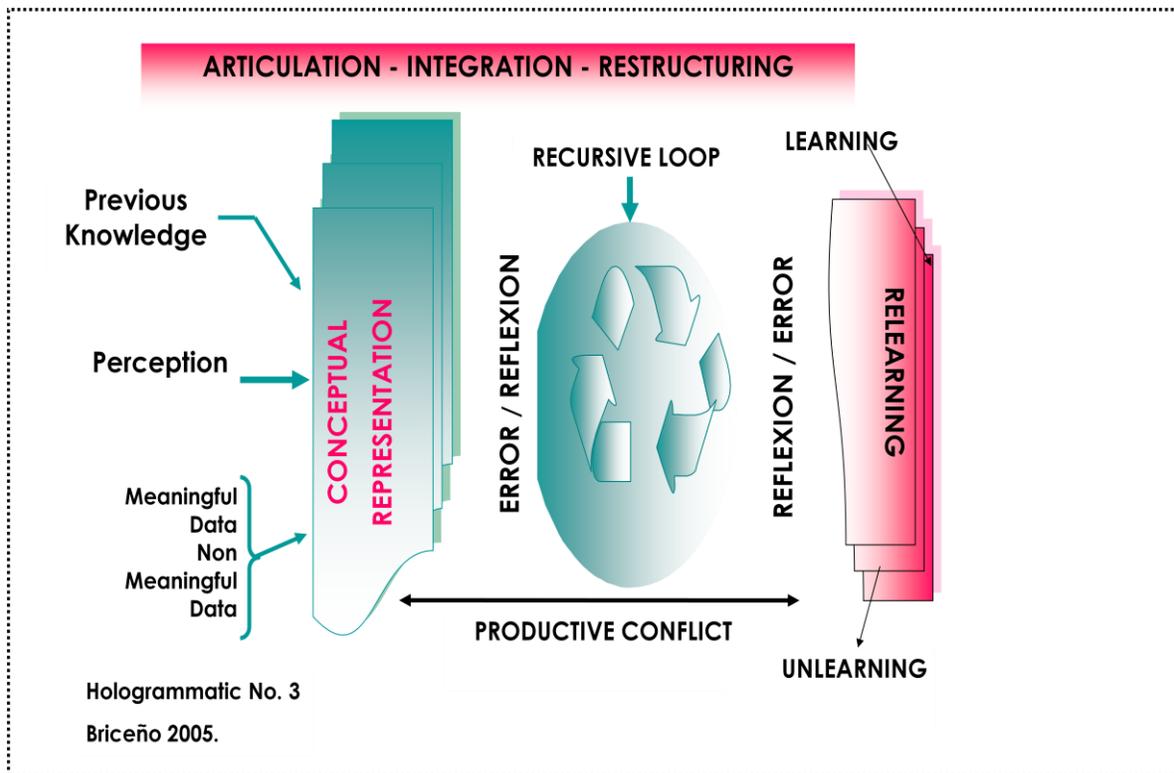
10. **Teamwork:** Learning how to achieve goals by using a team, consciously allocating roles, managing inputs from others, coordinating actors, and handling conflicts; managing operations using a model of processes and handling real time issues
11. **Negotiation:** Making a deal; negotiation/contracts; resolving goal conflicts
12. **Describing:** Creating conscious descriptions of situations to explain them to others in writing and orally

These elements presented by Schank are favorable to apply them in learning spaces, and promoting the construction of knowledge from the triad: reasoning - action - interaction. Now, this perspective the teacher who mediates of learning not only respects the potential differences and skills of the participant but also promotes the achievement of meaningful learning. This intentional construction of learning, i.e. the subjective disposition, it is not a monolithic process; on the contrary it is a relationship with high cognitive dimensions, competences and performing. Briefly, it summarized that in the educational process is very important to assess the cognitive aspect and involved teaching strategies, learning resources.

The criticism is that it is still present in the reality of error learning environments, which is penalized, the participant in some cases is being labeled or the worst he /she is ignored. In judgment of De la Torre (2004), there is pedagogy of success based on the principle of the right answers, but if it fails, it leads directly to failure. In my opinion, this pedagogy is highly common in learning syages, where in most cases the construction of alternatives to relearn is not considered.

Similarly, between thought and action coexists error because: It is present in learning environments, coexists with the subject, the error is spontaneous, it is inevitable, singular and relative, is not fragmented, it is a challenge for the facilitator, is the product of guesswork, conceptions which confirm the activity of thought, it is a tool for reflective / metacognitive process. Of course it is recursive link learning - unlearning-relearning.

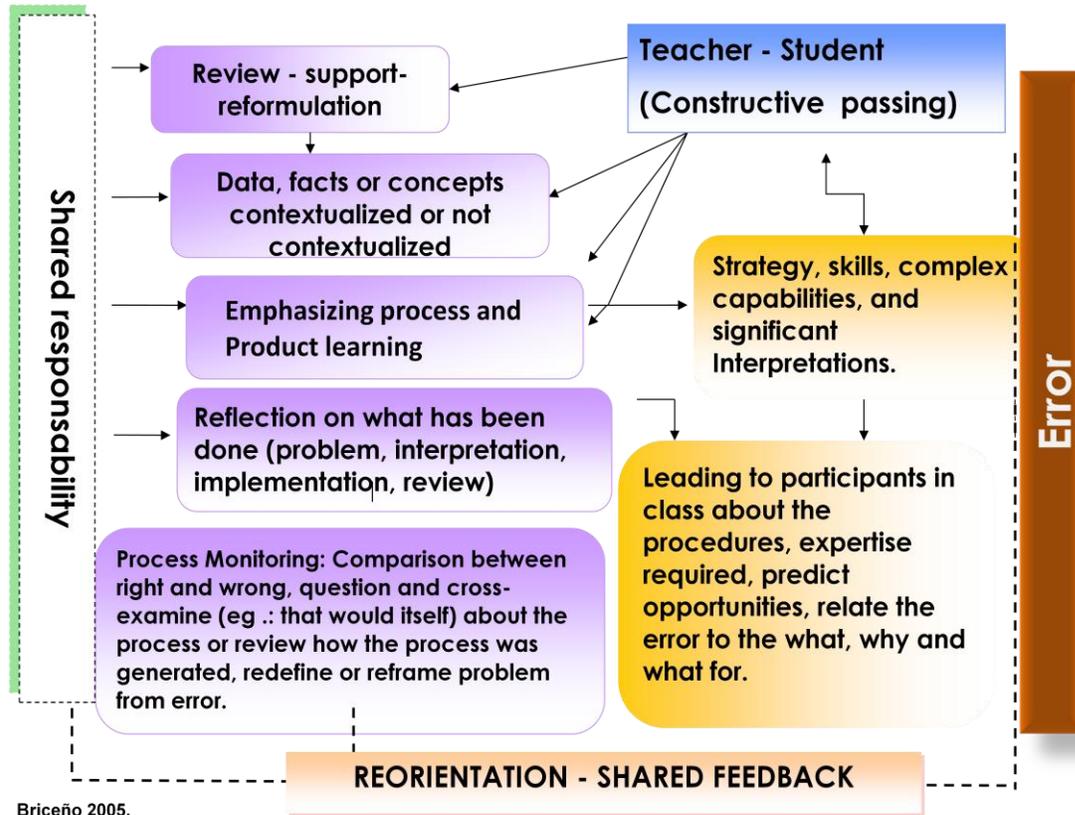
Similarly, it is valid to assume the error as a productive conflict, that generates a recursive loop where the error with reflection is linked, since it generates a mental process that requires intertwining concepts, information, knowledge that promote emotional connotation, experience, skill, critical thinking, is an encounter between convergence, divergence and constructive iterativity in the classroom. This process is summarized in the following figure (In Briceño, 2011):



A sequence is presented, that focus on the feedback on the observation, in order to address not only the difficulty of learning and understanding, but also to the entropy of sense to promote understanding of the need for the act of learning where students have their own rhythm to learn. Similarly, it is a correct and enabling environment for co-construct knowledge through discussion, reflection and dialogic space. This process may be repeated many times until even be aware of what is wrong and no longer commit or back flow progress, without neglecting the feedback.

All this leads us to take positive steps in error, and its use in learning environments. In teaching practice, it is essential to develop positive motivation as driving force for learning, both intrinsic motivation and extrinsic are key in the development of learning and management of equivocation. Variability of them (mistakes) determines the degree of handling and confidence to the participant, which will allow a climate of coexistence, in addition to communication that is productive for everyone in the classroom.

For the purposes of this approach, consideration of the error and the inclusion of it in learning environments from this perspective are conceived following: (See hologrammatic in Briceño, 2011)



This invites us to emphasize, moreover, that the learning process is not exclusive to the teacher, however, it is his or her responsibility to provide the participant (pupil/student) an environment of low anxiety, try to avoid frustration, do not be ashamed if he/she is wrong but it capitalizes as a reflective tool relearn split. It is clear that the learning context can

have an effect on the level of confidence in students as well as their performance and creativity.

Obviously, to change perceptions about student errors and comprehensibility that teachers should be, even when they are tutors of thesis is a way that improves learning errors. Change the vision and label errors is a wake-up call to value in teaching and learning.

In any case, the error is a repetitive loop in all ages and stages of learning, address it and apply it to different situations allows experimentation, comparison, reflection and production of knowledge.

A student can go back and if there is understanding of a subject is deep enough to solve problems. Apply knowledge is perhaps more important than the acquisition of knowledge, which leads to a process of acceptance, i.e., I was wrong, and then it goes to reflection and unlearn and then relearn. It is an iterative plane.

An error is iterative, also it allows us to understand the action to be wrong, correct and re correct in a recursive and constructive manner; allowing feedback of the learning process and learning new strategies. (Briceño, 2011) A training environment, where they play fluid communication and correcting issues with reflexivity outlined. It is very significant that the first step is to recognize the mistake, then why did I go wrong, analyze and make mistakes rather than punitive fun is a great ally in learning.

Next, I present some activities in learning environments:

- Discuss group on the mistake, comment and contrast it with the assertion, concept or right, or just solution to confront the contradictions and integrating ideas or adverse and diverse thinking.
- Deconstruct information, shred or defragmented as an associate and disassociate activity or re organizational activity. Exploring process of different ways to solve a situation, check if the mistake contributes to improve the process or problem resolution.
- The facilitator should not only explain, but must lead, guide and strengthen knowledge on the apprentice subjects who is wrong and who therefore demands for their help. The teacher may foster collaborative and cooperative participation.

## **By way of closing**

Undoubtedly, the error is part of the implications and applications of the learning process in all fields and levels, to approach it are not only focused on pedagogy but also cognitively. Criteria such as respect for different potentials, motivation, as well as venturing to consider an allied tool for developing reflexivity and creativity are very important aspects to consider.

Also, take the time to feedback to the process and to familiarize participants about the error is normal. To err is very important to correct even more to relearn, which contributes to the student to be responsible for the process, feel respected and participatory, is both critical and creative production well.

Obviously, teaching is structured to develop knowledge, learning, knowledge, creativity, regardless of respect for the other, their talent or potential is not possible to assert that the process is complete. Promote a harmonious environment for exchange of ideas to enable the development of new concepts addressing uncertainty uninhibitedly and with adequate flexibility creates an environment conducive to err and learn environment. Finally, let's assume the following message:

***“Learning occurs when someone wants to learn, not when someone wants to teach.”***  
***Roger Schank***

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