

Ensaio Pesquisa em Educação em Ciências (Belo Horizonte)



Este é um artigo publicado em acesso aberto sob uma licença Creative Commons.

Fonte: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1983-21172017000100207&lng=en&nrm=iso. Acesso em: 10 jan. 2018.

REFERÊNCIA

ARAÚJO JR, Antônio; AVANZI, Maria Rita; GASTAL, Maria Luiza. An experience of confluence between scientific and autobiographical narratives in biology teaching for young and adult students. **Ensaio Pesquisa em Educação em Ciências**, Belo Horizonte, v. 19, e2705, 2017.

Disponível em: <http://www.scielo.br/scielo.php?script=sci_arttext&pid=S1983-21172017000100207&lng=pt&nrm=iso>. Acesso em: 10 jan. 2018. Epub 11-Maio-2017. doi: <http://dx.doi.org/10.1590/1983-21172017190104>.

ARTIGO

AN EXPERIENCE OF CONFLUENCE BETWEEN SCIENTIFIC AND AUTOBIOGRAPHICAL
NARRATIVES IN BIOLOGY TEACHING FOR YOUNG AND ADULT STUDENTS

Antônio Araújo Jr.*
Maria Rita Avanzi**
Maria Luiza Gastal***

ABSTRACT: This is an action-research developed among young and adult students of a public school in Distrito Federal, Brazil. The articulation between school-knowledge and experience-knowledge occurred during a workshop in which zoology contents were addressed from the standpoint of the relationship between students and other animals. Stories were shared in a circle and the texts produced were exhibited on a literary string at the school yard. Our proposal is based on Paulo Freire's assumptions and on their links to other authors, according to which every teacher is a reading and writing teacher; the school is a legitimate instance for the construction of knowledge; every learning process is an exercise of re-reading one's own experience. This research shows that it is possible to organize activities that value the personal life paths of subjects without failing to teach natural sciences, with the benefit of helping the construction of a personal and collective memory.

Keywords: Young and adult education. Life histories. Literary string.

UMA EXPERIÊNCIA DE ENCONTRO ENTRE NARRATIVAS AUTOBIOGRÁFICAS E
NARRATIVAS CIENTÍFICAS NO ENSINO DE BIOLOGIA PARA JOVENS E ADULTOS

RESUMO: Trata-se de pesquisa-ação desenvolvida com jovens e adultos de uma escola pública do Distrito Federal, Brasil. A articulação entre saberes escolares e saberes da experiência se deu numa oficina em que conteúdos de zoologia foram trabalhados a partir da relação entre os estudantes e animais não humanos. As histórias foram compartilhadas em roda e os textos produzidos foram expostos em varal literário no pátio da escola. A proposta baseia-se nas premissas freireanas e nas relações delas com outros autores, segundo os quais todo professor é um professor de leitura e produção de textos; a escola é instância legítima de construção de conhecimento; todo aprendizado é um exercício de releitura de sua experiência. Decorre desta pesquisa que é possível organizar atividades que valorizem as trajetórias de vida particulares dos sujeitos sem deixar de ensinar ciências, com o benefício de favorecer a construção de memória pessoal e coletiva.

Palavras-chave: Educação de Jovens e Adultos. História de vida. Varal Literário.

*Master and doctorate student in
Science Education (UnB),
Brasília, DF- Brazil.
Professor of the Brazilian
Army's Education and
Culture Department (DECEX).
E-mail: <antonio@cmb.ensino.eb.br>.

**Doctor in Education; Assistant
Professor at the Scientific
Education Center of IB/
Brasília's University (UnB),
Brasília, DF- Brazil.
Postgraduate Program in
Science Education/UnB.
E-mail: <mariarita@unb.br>.

***Doctor in Ecology; Associate
Professor at the Scientific
Education Center of IB/
Brasília's University (UnB),
Brasília, DF- Brazil.
Postgraduate Program in
Science Education/UnB.
E-mail: <gastal@unb.br>.

UNA EXPERIENCIA DE ENCUENTRO ENTRE NARRATIVAS AUTOBIOGRÁFICAS Y NARRATIVAS CIENTÍFICAS EN LA ENSEÑANZA DE LA BIOLOGÍA PARA JÓVENES Y ADULTOS

RESUMEN: Esta es una investigación-acción desarrollada entre estudiantes jóvenes y adultos de una escuela pública del Distrito Federal, Brasil. La articulación entre conocimiento escolar y conocimiento a partir de la experiencia ocurrió durante un taller en el cual contenidos de zoología fueron abordados a partir de la relación entre estudiantes y otros animales. Historias fueron compartidas en un círculo y los tex-tos producidos fueron exhibidos en un tendedero literario en el patio de la escuela. Nuestra propuesta está basada en las premisas de Paulo Freire y en sus conexiones con otros autores, segundo los cuales todo profesor es un profesor de lectura y escrita; la escuela es una instancia legítima para la construcción del conocimiento; todo proceso de aprendizaje es un ejercicio de relectura de nuestras propias experiencias. Esta investigación muestra que es posible organizar actividades que valoran la trayectoria de vida de cada uno de los sujetos sin fallar en la enseñanza de las Ciencias Naturales, con en beneficio de ayudar en la construcción de una memoria personal y colectiva.

Palabras clave: Educación de Jóvenes y Adultos. Historias de Vida.++ Tendedero Literario.

YOUNG AND ADULT EDUCATION (EJA)

Young and Adult Education (EJA, in its Portuguese acronym) is a basic Brazilian education mode designed for people who interrupted or did not have access to education at their regular school age. This mode therefore shows an evident heterogeneity. While some students attend EJA because they have successively failed in regular school without having interrupted their studies, others have dropped out of school and have been away from regular education for decades. There are also those who have not had any previous formal education. Moreover, some of them have learned literacy quite recently. This typical diversity in EJA is highlighted in the official documents of the Ministry of Education (MEC, 2006):

“In the cities, schools for young and adults welcome students with completely different life traits, backgrounds, ages, professional experiences, school records, learning pace, and structures of thought. To each reality corresponds a type of student (...), they are people who live in the adult universe of work, with social and family responsibilities, and whose ethical and moral values stem from experience, environment, and the cultural reality in which they are inserted.” (page 4)

In fact, EJA public is comprised mainly of workers, even though some are unemployed or underemployed (Gadotti & Romão, 2010a). Although students bring a lot of knowledge from their environments and labor activities, this knowledge is frequently regarded as dissociated from school knowledge.

Differences in life traits might be one of the causes for divergence in these students' educational goals. Some see school as part of their preparation to enter a higher level education, and therefore believe it should be challenging, demanding. At the same time, and sharing the same space, there are those who simply wish to make up for the lost time, to overcome intellectual or emotional difficulties that made them drop out of school at regular school age, and thus, consider that school must be an understanding and welcoming environment.

The way EJA students read the world (Freire, 2009) provides them with different possibilities and potentialities compared to regular school students. Gadotti & Romão (2010b) defend that it would not be correct to consider EJA as a simplified version of regular education:

“We criticize concepts that consider adult education some type of compensation, a mere replacement for school, ignoring it as workers' education. These views, which have inspired the creation of supplementary education, primarily incur in a principle misconception: they use regular education as a reference model for the education of young and adult students” (page 114)

The lack of knowledge about EJA's public is still one of the challenges in the elaboration of teaching and learning practices specifically designed for these students. The narratives'gathering shown here highlights the huge pedagogical potential contained in the richness of experiences of young and adult students and makes us lean over the same issue which led Paulo Freire (1996) to ask “Why not establish an intimacy between the curricular knowledge essential to students and their social experiences as individuals?” (page 30).

CONCEPTUAL FOUNDATIONS

This study results from the experience of one of the authors as an EJA teacher in Distrito Federal (Brazil) and from the experience of the research subjects, reported in the authors' voice. To begin with, we should clarify the meaning, or the several meanings, this word (experience) takes on in our study. "Experience" here follows the definition by Larrosa (2015): "experience is what occurs, what happens to us, and touches us." (page 18). We therefore cannot mistake experience for a simple group of events or information. For experience to take place it is necessary that the subject-person provides their own meaning to what has happened, and is somehow changed by what they have experienced.

Although "experience" is a recurring word in our study, it is not alone in the conceptual framework it is inserted. Two other terms form a kind of conceptual tripod with the word "experience": mediation and language.

The sense of experience brought by Larrosa makes way for the concept "pedagogical mediation", elaborated by Lopes (1997), to whom "school knowledge is, in its own, an instance of knowledge, a process of (re)construction of scientific knowledge" (page 563). In the author's opinion, the construction of this knowledge takes place through a process, dialectical in nature, that involves creating a reality by means of contradictory mediations, of complex relationships between knowledges derived from several social practices.

Experience-knowledge, as a unique, non-repeatable construction, which is in-dissociable from the subject-person, as are knowledges derived from social practices, thus claims its space in the construction of school culture. Another social practice that must be considered in the construction of knowledge shared in school is language, a social practice that goes beyond fragmented contents. Silva (1998) elaborates three theories on teaching how to read in Brazilian schools. The first one is that every teacher, regardless of the course they teach, is a reading and writing teacher. The second one is that creative imagination and fantasy are not exclusively related to literature classes. The third defends that integrated text sequences are basic prerequisites to forming the reader, and it is linked to the two former theories because it requires the teaching staff's integration as a condition to implementing a previously structured reading program.

Therefore, there is a dialogue between the ideas of experience, pedagogical mediation, and language. In addition, there is a confluence between this dialogue and the idea of reading the world, which is a central reflection in a large portion of educator Paulo Freire's work. He proposes that "reading the world always precedes reading the word" (Freire, 2009); in other words, the effort of understanding reality precedes the effort of understanding textual signals in the education of an individual. In the learning process, the contact with context, in the form of experience-knowledge, comes before the contact with the text *per se*. This view justifies the adoption of words derived from the students' vocal universe in literacy programs elaborated by Freire.

Similarly, in science teaching, scientific concepts and processes are preceded by the world, they spring from experiences and explanations that the students themselves created for their reality. It is possible to organize activities

that take language, yearnings, concerns, claims, and dreams of the subject-person into consideration without failing to teach science. In Freire's opinion (1996), acknowledging the personal and historical essence of knowledge brings the teaching practice closer to a truly scientific attitude.

Experience, pedagogical mediation, and language intertwine and come together in Paulo Freire's thought. It is well known that, in their praxis' construction, the educator must necessarily assume the effort of reading pupils' readings of the world. As every learning process is a rereading exercise, this article purposes to examine elements that rise from the encounter between autobiographical and scientific narratives on the topic "animals". We assume that it is necessary to offer the student the opportunity to reread, and consequently, rewrite their experience by including scientific concepts and explanations. We understand scientific narratives as texts that use language with their own codes, and that therefore require mastering that knowledge to some extent. Regarding personal or autobiographical narratives, we agree with Ferrarotti (2010), who is foremost interested in "*their subjective pregnancy in the framework of interpersonal, complex, and reciprocal communication between narrator and observer*" (page 42). Therefore, such narratives are here understood as reports of moments in the personal history of the subject-person, communicated to one or more interlocutors.

METHODOLOGICAL DESIGN

The experience reported in this study, which has resulted in a Master's dissertation (Araújo Jr., 2011), took place in a teaching institution in the administrative region of São Sebastião (approximately 30 km away from the center of Brasília), where one of the authors worked as an EJA teacher for the State Secretariat for Education of Distrito Federal, Brazil.

This institution promotes annual interdisciplinary workshops. In four or five meetings, traditionally, teachers offer, in pairs, a mini-course with a freely chosen topic (cooking, recycling, music, and journalism are some examples of workshops that have already been conducted). On the days intended for these meetings, students choose a proposal of their interest, regardless of the class they are enrolled in. Thus, one workshop might be attended by students of different school years, joined by their shared interest in the offered proposal.

We designed a proposal that encompassed topics comprising biology/natural sciences curriculum and, at the same time, exploited life histories and compared different types of texts. We have, thus, chosen zoology. The result was the workshop "Nós e os Animais: Histórias de Vida Penduradas em Cordel" (We and the Animals: Life Histories on a String), conducted by the teachers Antônio Araújo Jr and Marina Soares. Our intention, when using the expression "We and the Animals" was not to create a dichotomy between the terms "Human" and "Animal"; quite the opposite, our intention was to emphasize the idea of a relationship between humans and non-humans as the focus of our study. The pronoun "We" stems from the need to make ourselves available for self-reflection and to place ourselves as subjects in the experience. The subtitle "Histórias de

Vida Penduradas em Cordel” (Life Histories on a String) refers to the expected product of these meetings: a personal and symbolic report, an invitation to textual production. The word “Cordel” is here intended with a double sense: on one hand, students would produce texts that would be exhibited on a string (cordel, corda, in Portuguese), a literary string, i.e., the word ‘cordel’ is used in a wider sense; on the other hand, the workshop environment and motivating texts would be inspired by the traditional Northeastern cordel literature, which is very familiar to the cultural context of a great number of students.

As a study that constitutes an experience and aims to provide meaning to this experience, we found shelter in qualitative methodology (Bogdan & Biklen, 1994), more specifically, in action research. Since there are divergences as to investigation submodes of this type of research, we must first define the meaning given here to the term “action research”. According to Avanzi (2005), Kurt Lewin was one of the first researchers to use the term “action research” to describe the investigative process in which actions are followed by self-critical reflection and result assessment. Over time, other authors have taken over the term; e.g. the *teacher as researcher* movement, which used it as a possibility to improve teaching practices, as teachers play the role of researchers in their own classrooms (Costa, 1991). With the influence of popular social movements in scientific research, action research has been considered a mode which is more concerned with stimulating students and teachers to further reflection on their own practice, geared towards emancipation. Such mode arises as a critical alternative to the model that divides people into “those who know” and “those who don’t know”, and research subjects generally have an active participation in it (Avanzi, 2005).

Therefore, we consider this study as action research according to three criteria. First, because the decision-making process took place as actions were followed by reflections, in a continuous cycle between action and assessment. Second, because the participants influenced the process of developing both actions and the decisions resulting therefrom. Finally, because of the emancipating political action, since this study is permeated by the intention that the subject-people take a critical stand regarding scientific topics and change their understanding of their role as students.

Participant observation was the main investigative tool, as the direct source for data construction was the experience of one of the authors as a teacher both at the school and of the workshop. Data was collected, for the most part, by notes, some of which were taken when events occurred, and others, *a posteriori*, resulted from reflection. The project meetings, which are described below, were audio recorded. The use of materials produced by the students during the meetings has been authorized by the signing of two consent terms: the first one refers to the recording of the meetings, and the second one refers to authorship (linking the materials to students’ names).

Our workshop, which had eighteen participants including the two teachers, was comprised of four meetings of approximately four hours; the last one was focused on exhibiting their production. Only four students attended the first meeting, which started with self-presentation dynamics. Participants wrote their names on a paper tag and posted them on a map of Brazil on the wall. A thread of string connected participants’ names to their states of origin. Aside from being

an element of identification, which associated elements of students' origins, this string promoted integration by recognizing the other as a fellow citizen, at a larger or smaller scale, depending on whether the city, state, or region was the same. After that, we asked them to write the popular name of an animal that had been significant to their life histories on a tag with a different color. They were only expected to post this tag beside their names, so that their identification would be associated both to the animal and the state of origin.

The course of the dynamics went beyond what had been pre-established. What would be an activity for students to introduce themselves took over the entire meeting when the first person who posted a tag on the panel decided to orally report the story they had with that animal to the other participants. The meeting became very similar to a storytelling circle. We asked them to bring these reports in writing so that we could have the pleasure to reread them and as a record. These written reports, which we started referring to as "personal narratives", gained a prominent position in our study.

In the second meeting, each student received a compilation of encyclopedic information about the animals they had chosen. The compilation contained a picture, the animal's scientific name, classification, morphological characteristics, life habits, and diet. These texts were elaborated by the workshop teachers based on an overview of information derived from technical references. When this collection was written, we had already heard students' oral reports but we hadn't read their written reports. Likewise, students handed their written reports before they had access to this technical compilation. We asked students to read the compilation and highlight the parts they found interesting.

At the third meeting, we asked students to write a "synthesis text", with elements from both their experiences with the animal and the technical information. An illustration made by each student was added and the resulting texts were hung on a literary string at the last meeting, in which school projects exhibited their production. At this point, we had no idea of the potential these texts would have in enriching the discussion on practices designed specifically for EJA teaching of scientific contents.

Therefore, we had elaborated only a consent term for the participation and recording of workshop meetings, which was distributed at the first meeting, and all participant students consented. This term ensured that their names and any information which could possibly identify them would be kept confidential. However, as we mentioned, the result of this workshop was surprisingly rich and textual production reflected this richness. Therefore, a conflict arose: students' production is their copyright, not ours. Once we introduced their production into this papers, students also became this narrative's authors. The workshop unfolded in such a manner that we believed that exhibiting part of their life paths would make many of them proud and that they might indeed want their names to be disclosed.

This reflection led us to elaborate a new invitation, a consent term for recognition of authorship of the material produced, which authorizes us to link students' names to their production. The intention was to formally develop a horizontal relationship with students. Therefore, we started referring to them

as subject-authors. This second consent term was elaborated months after the workshop was over, when some of the participants had already left the school.

Jessuy, Rosirene, Juliete, Jelson, Isabela, Leila, Cleusa, and José Aparecido are the original names of the students who provided their consents. Some, such as Jessuy, actually requested their names were linked to their history. Other students have not been found. To those, therefore, what had been agreed upon in the first agreement is still valid: secrecy on information that might lead to their identification. We shall refer to them using fictitious names: Vicente, Valter, Anderson, Gustavo, Bernardo, Valquíria, Ronaldo, and Valdirene.

The production's analysis made by the subject-authors, described in the next session, was an effort to interpret their reading of their own experience from the standpoint of science and to read science based on their experience. Considering that, in our methodological approach (reflection upon the investigation structures' own development), this narratives' encounter poses some interesting questions: If we compare different types of texts that address the same subject, is it possible that the elaboration of the autobiographical text (personal narrative) helps to understand the technical-scientific text (compilation of scientific information) and vice-versa? Which aspects arise in (or from) the synthesis text?

READING SCIENCE THROUGH EXPERIENCE AND READING EXPERIENCE THROUGH SCIENCE

The narratives materialized in students' production carry many potentialities for the discussion on biology teaching in the light of the conceptual tripod that supports this research: experience, mediation, and language. Surrounding - or rather in the center of - the ideas of this tripod is the Freirean notion of reading the world (Freire, 2009). We present here a reading of a student's reading of the world, Jessuy (pronounced as in French *je suis*; I am), who reported her experience with an armadillo. Jessuy's production is used as an axis whence the aspects analyzed stem from. It is as if Jessuy invited her classmates into dialogue through her production.

The choice for this student as a front line in the analysis arose due to the density of her story and due to the way she narrated her experience. She experienced the writing process in a differentiated manner, embraced the experience of rereading scientific knowledge based on extracts of her life history, and at the same time, she reinterpreted her life history based on the scientific knowledge presented to her.

As we said, Jessuy was adamant about signing her writing, which was in accordance with our intention. Once associated to her name, her life report became stronger and more charming. No fictitious name would rise up to the task of naming someone "I Am".

Our analysis follows the order of the workshop meetings. First, the aspects present in her personal report are discussed. Then, we analyze the aspects brought by the reading of the compilation of scientific information and finally, the rereading contained in her synthesis text.

PERSONAL NARRATIVE

The following text is the transcript of the personal report handed in by Jessuy.

“Life in the farm and its survival.

I present here my story. When I was a child, still living with my family, my father with my mother and my seven brothers and sisters. João, my father, was a traveller; he didn't stay long in our house. His life was to travel around the world, leaving my mother, Maria, and my brothers and sisters behind.

Because of these circumstances, I could witness the cruel life my family had to struggle with in the countryside. As it turns out, so far God Our Lord has helped us.

I followed closely the harsh existence of a woman, a fighter, my mother. As my father was not there, she had to struggle as she could, and it was her responsibility to feed us.

My mother never felt discouraged, she simply used her tools and skills, which was hunting at night. Since we could only eat meat on the weekends and we couldn't buy meat, she would go in search of an animal to feed us with. On a Friday night, she left us sleeping and went to some woods nearby. With the help of a dog, she went hunting.

As soon as she caught the armadillo, after a positive hunting, she came home as quick as possible as she had left us sleeping and needed to return before we woke up.

However, a surprise awaited her: mom and her dog got lost, and after trying hard, she managed to find her way back. Thrilled, she came home with the armadillo.

When she arrived, even though she was tired, she cooked the meal, as Saturday was a special day; after all, we would have armadillo meat for lunch. We were all excited; it was party day for us, like getting presents. When Saturday came, we would say ‘we're eating meat today’, and it was like a banquet.”

Jessuy proudly and happily reports the story in which her mother goes hunting and brings an armadillo for the family to eat. She uses the harsh survival in a rural setting as a guiding assumption in her text. Based on this aspect, she addresses her family relationship, the social economic conditions in which she lived, and the resolve of her mother, who she refers to as a fighter.

In the experience-knowledge notion by Larrosa (2002), the manner by which the subject-person provides meaning to what they have experienced is important. When we received the reports from the students, our first objective was to find the meaning that they provided to the events in their reports. Some aspects that are present in these personal stories helped us better understand subjects' perspectives: affection, childhood, and work.

Animals and affection

We noticed that the choice for the animal was guided by affection in several reports. Several students chose pets for their reports. Although Gustavo's and Bernardo's pets are still alive, in most cases, the choice was marked by the longing

for animals that had already died and that were called by their given names. Juliete, for instance, shows a very emotional report of the time when Nike, her dog, died defending their house from crooks. She orally reported, at the third meeting, that her illustration brings a photo of Nike, which was torn by her sister who couldn't bear "dwelling on how much she missed" the dog. Anderson also told us about Bidu, his dog that had sadly been run over by a truck while playing on the street. Xandy, Leila's family cat, disappeared, and Chico, José Aparecido's stepmother's parrot, "was caught by an animal when he was climbing a tree".

Jessuy could have also chosen the dog as an affective animal for her report. It was the dog that kept her mother company throughout the period when she was away from her children. It was the dog that shared with her the risks of hunting animals at night and of getting lost on the way home. Other students chose the dog for this reason. Jelson, who would go out at night to track deer on the countryside, focused on the dog, not the deer, to tell his story. In Jessuy's case, the reason why the object of her affection was the armadillo and not the dog will be resumed further on, when we analyze her synthesis text.

Overall, the animals chosen by students seem to reflect what Descola (1998) defines as the anthropocentric view of nature, in which "at the top are species perceived as being closer to man due to their behavior, physiology, cognitive skills, or to the ability attributed to them of feeling emotions" (page 23). According to Razera *et al.* (2007), anthropocentric approaches are reinforced by the media which, in its programs about nature, "assigns to animals attitudes, reasoning, attributes, anxieties, and concerns which are typically human" (page 1). Consequently, this view is consolidated in zoology contents and casting it aside would be difficult. "Typical human anxieties and concerns", to use the words of Razera and collaborators, are elements that affect us and contaminate our perception of the natural world. Our study, however, adds a new perspective to this discussion. Providing the human being, their life paths and their memories, with a central role in zoology teaching doesn't necessarily mean reinforcing a relationship of domination over the natural world. What is shown here by reading the subject-authors' production is that we do not need to relinquish whatever affects us to build a scientific perception of animals. We can use this affection, this affectivity, to teach biology. What we defend here is to prize affection instead of silencing it, and we defend the concept that the worth of other species reaches beyond simply serving human needs.

Animals, family, and childhood

Telling stories about oneself and one's relationship with animals implies telling stories about one's family. Anderson was gifted his dog by his father. José Aparecido's parrot belonged to his stepmother. Leila's cat was brought by her sister. Even Jessuy, who did not choose a pet, brought a text full of family relations. It is evident, in Jessuy's report, that she admires her mother, who manages family responsibilities in her father's absence.

Family relationships seem to have also been the motivating theme of Rosirene's and Cleusa's reports. Like Jessuy, they reported living in a rural setting

during their childhood. The animals they chose, the cow and the horse, respectively, are animals of the farm they lived, and although they were also domesticated, they represent different esteem aspects. They are not, for instance, called by their names. In Cleusa's report, the horse is associated to childhood games, to her bond with her brothers and sisters: "*We would all ride a horse together and would have a blast with the others falling off*". In Rosirene's case, as with Jessuy, the relationship with the animal is associated to the social economic situation of the family, with the difference that her memory was of fat times. "*My family had many oxen, we were well off. We didn't buy food because there was plenty of everything*".

It is worth noting that our proposal to the students did not specifically mention childhood. We asked them to talk about an animal that had marked their life paths, and this was not limited to childhood. However, somehow everyone invoked childhood memories to choose their animals in the activity proposed. Kohan (2007) defends that there is a relationship between infancy, experience, language, and history, and this relationship allows us to imagine new places for childhood in our study. Kohan recalls that the etymology of "infancy" comes from the Latin word in - fans, "not able to speak", which refers both to those who are not yet able to speak and those whose words cannot be used to testify in court. To Kohan, childhood is not a matter of age but a condition of experience related to the intensification of our bonds to language, since children are the ones who learn to speak, apart from a few exceptions.

Hence, once we revive childhood memories, we are involved in a creative moment of invention. We invent a new meaning to whatever happens to us through unexpected relationships between experience and word. Human beings are always infants, as we never complete our experiences in language.

Human incompleteness and unfinished state¹, ideas Freire held so dear, are linked to the condition of being an infant with experience and with language. The condition of being an infant is what allows us to learn language, including the so-called scientific language. When we address adult students, we are addressing their "child" dimension, the childlike relationships they have with language, with what they are, with what they know.

The relationship between infancy, in the perspective mentioned above, and animals is present in the personal reports of our students. This relationship can also be seen under a broader perspective. Albuquerque (2007), when discussing the constant use of animals in children's literature, suggests that this choice goes beyond a simple motivational aspect:

"One could wonder if these books refer to animals because children like them and thus their attention is better caught, and this is not false. The mistake is to envision something childish in this attraction. Something to be overcome by the seriousness of adulthood. (...) Children do not have a childish relationship with animals, they have animal relationships with animals, and this is what is rich about living with animals, it enables us to have this relationship, no matter our age." (page 233).

Part of the pleasure adults feel in telling their stories is due to their childhood recollections, and consequently, to recollections of their animal

relationship with other animals. Cleusa's report, for instance, seems to carry a generous laugh between the lines: *"It was a blast having so many children on top of the horse tumbling off all the time. It would take us hours and hours striding around the empty lot, it was really good to play with my brothers and sisters and ride a horse"*. We had envisaged a workshop that worked the relationship between humans and non-humans. The subject- authors, with their reports, added the relationship between animal and animal to that human-non-human relationship. A great deal of the beauty of this study is owed to that.

Animals, work, and survival

The tools and skills that Jessuy's mother had for hunting at night drew our attention to labor relations. It is evident that in EJA classrooms, nearly all students appreciate work. One of the best compliments one can pay to someone is to call them hardworking.

Soares (2005), in her dissertation on life and work of EJA students in Porto Alegre, asks some students what work means to them. Some consider work as a synonym for job: *"Well, nowadays, when many people are unemployed...speaking of Work is as if we had a treasure."* (page 182). Others strongly associate work with survival: *"It is my livelihood, because without work we don't eat.. we don't live... To me, work brings everything...right? Without work we can't survive...we need to work to develop ourselves."* (page 181). Yet others have a view of work as something less related to job or to a labor activity; it is more related to an ethical dimension, which constitutes the subject-person: *"Life and work are synonymous to me..."* *"Oh, my work...is my life...everything I am is thanks to work"* (page 182). Working, in this conception, is a condition for dignity, which goes way beyond survival. Under this perspective, the dignified individual works, even though their survival does not depend on it.

Vicente, in his report about the donkey, takes the animal's side, which is "quite a hardworking animal": *"When it is time to carry the weight, whatever was intended for our backs falls upon the donkey's back"*. And he reported that when someone refers to another person as an ass, it would be the animal they would be offending.

Survival, the main guider in Jessuy's text, makes room for a more in-depth discussion about the relationship between humans and non-humans, mostly regarding conflict of interests, which sometimes exists when we choose the survival of the human at the cost of the survival of a non-human. Jessuy's text unfolds the conflict. The survival of Jessuy's family infers the non-survival of the armadillo. In the particular case of Jessuy, the compilation of encyclopedic information contained an observation about armadillo hunting, which added new elements to this conflict that shall be discussed over the next two sessions.

SCIENTIFIC INFORMATION COMPILATION

The armadillo is a mammal of the order Xenarthra, family Dasyopodidae, characterized by the armor that covers its body. Native to the American continent, armadillos inhabit savannahs, cerrados, riparian forests, and dry forests. They are important for medicine, as they

are the only animals, aside from human beings, that can contract leper, and are used in the study of this disease.

Armadillos are also of great ecological importance because they are capable of feeding on insects (insectivores), thus contributing to the balance between ant and termite populations.

When these animals are hunted by their hunting value, the ecosystem ends up unbalanced because a natural insect controller is exterminated, thus favoring the increase of these invertebrates, which might lead to economic problems in the region.

When it is protecting itself against other predators, the armadillo rolls up, forming a nearly indestructible armor ball. Sometimes not even a run over can perforate the armor that covers it.

*The six-banded armadillo or yellow armadillo (*Euphractus sexcinctus*) is found in Suriname, north of Argentina. This species has a brownish color, a carcass covered with scarce hair, with six or eight movable bands, and pointed and flattened head. It is nocturnal, solitary and omnivorous, feeding on a wide range of plants and animals, including carcasses; this is why it potentially transmits botulism, an important disease in cattle culture, and which also is a zoonosis.*

In the transcript, the underlined extracts were highlighted by the student herself, and represent points that she believed were interesting and that would potentially integrate the synthesis text. The reading direction here is reversed. In the personal report, the teacher read a text written by students and highlighted some points. In this encyclopedic compilation, it is the student - Jessuy - who reads a text written by the teachers and highlights some aspects.

When elaborating the compilation, we chose to insert the largest amount of elements available to the students, such as classification, morphology, ecology, relationship with humans, and biogeography.

We found room in the workshop to draw connections, both phylogenetic and ecological, between species. Once they read the compilation, students raised doubts about terms such as artiodactyla, felines, perisodactyla, carnivores, canids. In order to answer their doubts, we would show the same term in their classmates' texts. For instance, when Valter read the compilation about the jaguar, an animal that he chose, he asked what a feline was. We indicated the same term in the compilation provided to Leila about the cat. We outlined the connection between the cat and the jaguar to build a concept of feline.

The text offered to Jessuy starts with the classification and habitat of armadillo species. Jessuy highlighted the information that it is a mammal. We explained that mammals are the group of animals whose females have mammal glands, and therefore, feed their offspring. We explained that we, human beings, are mammals and nurture our offspring. The relationship between this piece of information and what was described in Jessuy's personal report, whose mother worked hard to bring food to her children, is clear. This information was not a mere piece of information on a given animal group, but stemmed from her life history.

Another characteristic highlighted by the student was the fact that the armadillo has its body covered by armor. The word "armor" was used in this compilation without knowing that Jessuy referred to her mother as a fighter (warrior) in her report. What meaning does the word "armor" have for a person who refers to her mother as a fighter? Wouldn't it be a quite different meaning from the one

employed by a taxonomist? Another aspect that was highlighted was that, like her mother, Jessuy's armadillo leaves its nest alone at night. Jessuy also underlined aspects related to the scientific and ecological benefits provided by the armadillo species.

Jessuy highlighted the entire third paragraph. It was the part that mentioned ecological unbalances that armadillo hunting might entail. This extract was not written as an attempt to impose some moral view on hunting. The concept of pedagogical mediation, one of the conceptual foundations of this study, rebuts the traditionally disseminated conception that the student brings outdated ideas to be replaced by "modern" school concepts (Lopes, 1997). Therefore, the intention of this extract was to promote a healthy conflict, and have the pleasure of observing and recording how Jessuy would overcome it.

Jessuy's response to this conflict is present in her synthesis text, written after reading the compilation of scientific information and transcribed below.

SYNTHESIS TEXT

"Underground is my home.

The funny warrior is a mammal with armor. It is cautious, an everyday work, great digger. No trampler can perforate the thick armor that covers its body. It rolls up, forming an armor ball. It threads itself into the earth. Antique beauty, fearful animal, used to throwing earth behind. Its shelter is a tunnel that protects him from daylight. It appears under the evening twilight in the savannah, cerrado, riparian forests, and dry forests. Little yellow-banded crusty ball, when it satisfies a human being's hunger, ends up unbalancing the ecosystem because a natural controller of insects is exterminated.

The synthesis text is the core part of students' production. It contains the relationships outlined between both readings, the one about their experience and the one with scientific information. These two readings are here related: students read science based on their experience and reread their experience based on science. It is with this constant exercise of rereading and rewriting the world, under Freire's perspective, that we find, in students' speech, the elements that validate their view of the proposal and assumptions that guided its conception.

When we read Jessuy's first text, we were in doubt about the reason why she chose the armadillo for her report. Her text allowed us to think that the armadillo might have no other meaning than food. We could even think that in Jessuy's opinion, a good armadillo is the one on a dish. However, reading the synthesis text, we distanced ourselves from this interpretation. The relationship between Jessuy and the armadillo adds another order of affection.

Some expressions she used earlier to describe her mother appear now in the description of the armadillo. In the extract "*Everyday work, great digger*", Jessuy praises the armadillo's tools and skills. In the first text, she praised her mother's tools and skills. The admiration of a hardworking being between Jessuy and her mother also brings Jessuy and the armadillo closer together.

Another example is the double sense in using the expression 'warrior': "*I followed closely the harsh existence of a woman, a fighter, my mother.*" "*The funny warrior is a*

mammal with armor...”. The words warrior/fighter seem to be used in both texts to refer to the courage and readiness of both the mother and the armadillo.

With armor, however, Jessuy seems to transition between the several meanings that the word might have: the instrument of a warrior and the skin coating that characterizes dasydops: “*No trampler can perforate the thick armor that covers its body, it rolls up forming an armor ball, and threads itself into the earth!*”.

The word warrior also appears in the compilation provided to Valter on the jaguar: “*In Mayan mythology (...), it was hunted in initiation ceremonies in which men would become warriors!*”. Valter’s reading of his compilation did not take this factor into consideration. Perhaps the boy who fled the jaguar did not identify himself with Mayan killers.

Valter produced an interesting text with the jaguar. He enriches the same narrative plane of the first report with scientific information:

“*I was on vacation in January 2008 in Piauí?*” (personal report)

“*This animal is found in hot regions. I was on vacation in Piauí?*” (synthesis text)

“*When I looked and spotted the jaguar?*” (personal report)

“*When I turned and saw that black animal with a large head compared to its body?*” (synthesis text)

“*I ran away and hid in the middle of the cattle?*” (personal report)

“*It needs at least two kilos of food per day, and I was inside its territory. I ran away and hid in the middle of the cattle?*” (synthesis text).

Therefore, in his synthesis text, Valter tells the same story now filled with technical information which he took over as his own. Valter shows he’s twice as knowledgeable: he manipulates, in his text, the experience he lived on his vacation in Piauí, and the reading he experienced in the second meeting of the workshop. He creates the narrative at a moment that was experimental, for its practical sense, and furthers it at another, more theoretical moment.

Jessuy develops a similar fusion between the texts when she addresses the hunting conflict. In this sense, aside from enriching her narrative with elements from the compilation, she enriched the compilation with elements from her narrative. In the text she was offered, the reference to unbalance was impersonal, distant: “*When these animals are hunted by their hunting value, the ecosystem ends up unbalanced because a natural controller of insects is exterminated!*”. Jessuy’s version seems much more complete: “*Little yellow-handed crusty ball, when it satisfies a human being’s hunger, ends up unbalancing the ecosystem because a natural controller of insects is exterminated!*”. This is Jessuy’s response to the conflict: she acknowledges that the ecological unbalance caused by hunting has social dimensions. Sensitivity to interrelations between a social setting and the environment is pointed out by Carvalho (2004) as an assumption to the change in values and attitudes that result in the formation of ecological subjects, which might be individuals or social groups that are sensitive to identifying, questioning, and acting upon socio-environmental issues.

This sociocultural dimension of environmental issues is a complex aspect to be worked inside science classes both in EJA and in regular education,

as it requires, among other elements, a maturity to outline relationships between problems of different discipline spheres. Reading, writing, and reliving her own personal experience was a bridge for Jessuy to achieve an integrated and integrating view of texts and perspectives, an alternative to overcoming a restricted curriculum.

CONTRIBUTIONS OF THE EXPERIENCE TO EJA

The work with reading, which is a guiding element in the workshop, opened new possibilities to enhance the relationship between students and language. When manipulating language in the students' synthesis texts, the playful aspects of reading and writing were a highlight. One of the difficulties in assessing the reading skills of EJA students is to define the criteria according to which reading might be considered complete. After thinking about students' production, we might consider the ability to play with language as one of the criteria. We toy with language, for instance, when we notice the multiple meanings words have and start to move amidst the several different possible interpretations. This conception that reading is to capture and play with the possibilities of interpretation and with the feelings caused by the text is related to Kohan's infancy (2007), already mentioned above. Reading is one of the ways people encounter language, and as such, it is also connected to the childish, playful part in us.

Textual allegories present in the text of many students show that they have experienced the pleasure to create new interpretations for words that they have read and written as if they were playing a game, and that they have known and provided us with an experience of trance and beauty of language.

The use of rhymes is an example of an aesthetic and playful resource in students' texts, e.g. Leila's report on the cat: "*As pretty as it might, it's not afraid of heights*". Isabela's text about the parrot has nearly all parts rhymed: "*Although it's intelligent, compared to us it is different. It is so hilarious that sometimes it is nonsensical. (...) It mimics sounds and even the human voice. And banana is its fruit of choice*".

Another aesthetic and playful resource in students' texts is the use of comparative images. José Aparecido does this at least twice when referring to the parrot: "*Its many colored feathers resemble a float passing by on Marquês de Sapucaí*" and "*There are many species with different colors, but its main colors are the ones from our country's flag*". Vicente also uses comparison to support his argument about the donkey: "*Human slavery was over and so it fell to the donkey*".

According to Silva's theses (1998) and their links to what was experienced in the workshop, the responsibility for the formation of some readers is to be shared among different courses. Creative imagination and fantasy enabled and were made possible by the comparison with technical scientific texts, and by the integrating processes between the two types of texts. In fact, any teacher can participate in the collective process of forming readers through the activities they develop in their specific courses.

In addition, the workshop activities were envisaged based on principles that might also guide the elaboration of regular classes: a) every teacher is a reading and writing teacher; b) school is a legitimate instance of knowledge construction;

c) every learning process is an exercise of rereading one's own experience; d) science teaching might benefit from the peculiarities observed in the context, from the richness of knowledges experienced, and from the comparison between different types of texts.

Educational actions that somehow rely on autobiographical narratives have been consolidated as approaches that go beyond contextualization and have increasingly become tools in the formation and autonomy of individuals. Catani (1994) states that “the pleasure of narrating oneself favors the constitution of a personal and collective memory by inserting the individual in the stories and allowing them to understand and act based on those attempts” (page 54). Therefore, there is a relationship between memories and the ability for understanding-acting. The present study reveals the richness of this material and an important outcome was the creation of an investigative group² who has been dedicated to consolidate the theory and methodology of narrative research. The group has developed investigative and education projects under this perspective, also in the context of EJA teacher training.

Oral and textual productions resulting from the workshop show a richness of life histories among EJA students. If the resulting potential for understanding and acting contained in this richness of experiences becomes manifest, we might be closer to an alternative for what Ribeiro (2008) points out as a core issue: “the need to broaden the concept of literacy and establish a concept of education to young and adult students that is not a depleted version of regular education and its minimum contents.” (page 10)

Hence, experience-knowledges and cognitive practices are not linked to unique universal knowledges and truths; instead, they are understood as something which is constantly changing. Those are concepts that contain the notion that experience cannot be separated from the individual who experienced it and who owns it and provides it with personal meaning. Moreover, it is knowledge deriving from experience that makes it possible for subject-people to have their own personal life.

One of the challenges faced by EJA teachers, therefore, would be to allow their classes to become opportunities for experiences, thus contributing for their students not to remain only as their pupils, but pupils of others, who might be or not be formal teachers. Knowing that everyone is a pupil of their own experience.

NOTAS

¹ Incompleteness and unfinished state have different meanings to Paulo Freire. “Incompleteness denotes the relational character of our existence: we are incomplete because “without the other we do not exist” (Antunes, 2003, page 66); The unfinished state, our insertion into a historical process that is in progress, places us in a “permanent social process of search” (Freire, 1998: page 61).

² Autobiographical Narratives and Science Teacher Formation, Institute of Biological Sciences, University of Brasilia.

REFERENCES

- ARAÚJO JR., A. C. 2011. **Histórias de Vida penduradas em Cordel: uma experiência de troca de saberes no ensino de Biologia para a EJA**. Brasília, DF. Dissertação de Mestrado. Universidade de Brasília - UnB. 131 p.
- ALBUQUERQUE, P. G. 2007. Sobre Animais, Literatura e Crianças. *In: D. LINS (org.) Nietzsche/Deleuze: imagem, literatura e educação*. Simpósio Internacional de Filosofia. Rio de Janeiro: Forense Universitária, p. 228 - 243.
- ANTUNES, A. 2003. **Leitura do Mundo no contexto da planetarização: por uma pedagogia da sustentabilidade**. São Paulo, SP. Tese de Doutorado. Universidade de São Paulo - USP, 268 p.
- AVANZI, M. R. 2005. **Tecido a muitas mãos: experienciando diálogos na pesquisa em educação ambiental**. São Paulo, SP. Tese de Doutorado. Universidade de São Paulo - USP, 313 p.
- BOGDAN, R. C. & BIKLEN, S. 1994. **Investigação Qualitativa em Educação**. 1ª ed., Porto: Porto Editora, 336 p.
- CARVALHO, I. C. 2004. Educação Ambiental Crítica: nomes e endereçamentos da educação. *In: P. P. LAYRARGUES (coord.), Identidades da educação ambiental brasileira*. Brasília: Ministério do Meio Ambiente, p. 303 - 322.
- CATANI, D. A. 1994. **Ensaio sobre a produção e a circulação dos saberes pedagógicos**. São Paulo, SP. Tese de Livre-docência. Universidade de São Paulo - USP, 322 p.
- COSTA, M. V. 1991. A caminho de uma pesquisa-ação crítica. **Educação e Realidade**, Porto Alegre, **16(2)** jul/dez: 47-52.
- DESCOLA, P. 1998. Estrutura ou sentimento: a relação com o animal na Amazônia. **Mana**, Rio de Janeiro, **4(1)**: 23-45.
- FERRAROTTI, F. Sobre a autonomia do método biográfico. *In: NÓVOA, A.; FINGER, M.(Org).* O método (auto)biográfico e a formação. São Paulo: Paulus, 2010. p. 19-57.
- FREIRE, P. 2009. **A importância do ato de ler: em três artigos que se completam**. 50ª ed., São Paulo: Cortez. 68 p.
- FREIRE, P. 1996. **Pedagogia da autonomia: saberes necessários às práticas educativas**. 41ª reimpressão, São Paulo: Paz e Terra. 82 p.
- GADOTTI, M. & ROMÃO, J. E. 2010a. Diretrizes Nacionais. *In: _____ (orgs.) Educação de jovens e adultos: teoria, prática e proposta*. 11ª ed., São Paulo: Cortez, p. 119 - 131.
- GADOTTI, M. & ROMÃO, J. E. 2010b. O papel dos Municípios. *In: _____ (orgs.) Educação de jovens e adultos: teoria, prática e proposta*. 11ª ed., São Paulo: Cortez, p. 113 - 119.
- KOHAN, W. O. 2007. Imagens da infância. *In: D. LINS (org.) Nietzsche/Deleuze: imagem, literatura e educação*. Simpósio Internacional de Filosofia. Rio de Janeiro: Forense Universitária, p. 324 - 327.
- LARROSA, J. 2015. **Tremores: escritos sobre experiência**. 1ª ed., Belo Horizonte: Autêntica Editora, 175 p.
- LOPES, A. C. 1997. Conhecimento Escolar em Química - Processo de Mediação Didática da Ciência. **Química Nova**, **20(5)**: 234 - 242.
- MEC. 2006. Alunos e Alunas de EJA (Coleção Trabalhando com alunos de EJA) Brasília. Available at: http://portal.mec.gov.br/secad/arquivos/pdf/eja_caderno1.pdf Acesso em 20/01/2015
- SILVA, E. T. 1998. Ciência, Leitura e Escola. *In: ALMEIDA e SILVA (orgs.) Linguagens, Leituras e Ensino de Ciência*. Campinas, SP: Mercado das Letras, p. 105 - 113.
- SOARES, R. S. 2005. **As contradições na vida e no trabalho dos alunos da EJA de Porto**

Alegre: Um estudo de caso. Porto Alegre, RS. Dissertação de Mestrado. Universidade Federal do Rio Grande do Sul - UFRS, Brasil. 208 p.

RAZERA, J. C., BOCCARDO, L., SILVA, P. S. 2007. Nós, a escola e o planeta dos animais úteis e nocivos. *Ciência & Ensino*, 2(1): 223-229.

RIBEIRO, V. M. 2008. **Educação de Jovens e Adultos: Novos leitores, novas leituras.** 3ª ed., São Paulo: Mercado das Letras, 224 p.

Submission in 30/05/16

Approbation in 28/10/16

Contact:

Antônio Araújo Jr

Universidade de Brasília, Instituto de Ciências Biológicas, Núcleo de Educação Científica.

Campus Universitário Darcy Ribeiro - Asa Norte

70910-900 - Brasília, DF - Brasil

