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DESIGN THINKING: THINKING ABOUT PROBLEM SOLUTIONS FROM A TRANSFORMATIVE EXPERIENCE

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ABSTRACT

This article is the culmination of the integration of the mandatory disciplines Creativity, and Innovative Methods and Techniques of Teaching and Learning, of the Graduate Program in Creativity and Innovation in Higher Education Methodologies (PPGCIMES), with the objective of materializing studies carried out throughout the disciplines and, at the same time, working on Creativity – from the conception of Mel Rhodes (1961) – and active methodologies, specifically, Design Thinking (DT). The latter was used in a proposal to develop a foreign language course (English for specific purposes) for postgraduate indigenous researchers (master's degree) from the Federal University of Pará (UFPA) to speak at COP30. The course lasts 20 hours, and has a glossary with environmental terms. The results were presented at the II Fair of Creative and Innovative Teaching and Learning Practices, evaluated by visitors and teachers who passed by the stand and, later, considered positive and relevant.

Keywords: Design Thinking. Active Methodology. Creativity. Foreign Language.

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INTRODUCTION

This work is based on conceptions of active methodologies worked in the discipline of Innovative Methods and Techniques for Teaching and Learning, anchored in Design Thinking, which aims to propose creative ways to solve problems. The work is an offshoot of research carried out by three people (Daciléia Ribeiro, Beatriz Dias and Gabriel da Silva), for presentation and exhibition at the II Fair of Creative and Innovative Teaching and Learning Practices. The proposal was to develop a course in a foreign language, using Design Thinking (DT). The language chosen was English, in the English for specific purposes modality, from this choice we began to conceive the intervention proposal until the materialization of the course, this was designed for five classes, totaling a workload of 20 hours, in synchronous and asynchronous format. The objective of the course was to prepare indigenous researchers from UFPA, our persona, for a lecture at COP30.

In view of this proposal, it is that we thought of working with active methodologies, because it helps us to reflect, preponderantly, on practices that will often require us to leave our comfort zone and act in an active and, at the same time, autonomous way, it is learning by doing, in the words of Carl Rogers (1985), because it is not possible to think of active practices without these pillars, since the very conceptualization of active methodologies requires the participants to be actively involved in the construction of their learning, which will often need to be resignified, given that, in an increasingly globalized world, permeated by technologies, the requirement is active, creative subjects, capable of acting in the world, in order to build knowledge with themselves and with their peers, in the process of interaction and cooperation, knowledge for oneself, and for society. In the same step, Moran tells us that:

> We learn when we discover new dimensions of meaning that previously escaped us, when we expand the circle of understanding of what surrounds us, when, like an onion, we peel new layers that previously remained hidden from our perception, which makes us perceive in a different way. We learn more when we establish bridges between reflection and action, between experience and conceptualization; when both feed each other. (Moran, 2013, p. 28).

If we learn effectively by building bridges between reflection and action, despite this, it becomes indispensable to think of knowing subjects as the center of the teaching-learning process – in Rogers' words: person-centered approach – and, therefore, they need to learn to make the necessary bridges for active and reflective learning at the same time. In this path, autonomy becomes indispensable for this construction, and when thinking about autonomy it is important to point out: the ability of each individual to manage their life, their choices, decide to act in order to learn to tread their own paths in this journey of training/construction of knowledge.

In this perspective of learning, active methods teach ways - point to a direction - to reach the solidification of learning and, at the same time, think of other ways of appropriating knowledge, as protagonists of their stories, because they are in the real world, in which they will be required more and more, and this is a recursive process, that is, infinite, since whoever decides to stop, definitively, will be deprived of the significant knowledge that is built during life and, consequently, of the best opportunities in a world ruled by neoliberalism, which is naturally exclusionary.

In this path of discovery, advancement and improvement, the work with DT presents itself as possibilities of paths for generating ideas and solving problems - since society is increasingly complex - in a creative and active way, learning and relearning, expanding the foundations that are laid, on which one walks. In fact, maturing solutions and responding to complexities is what is expected. In addition, it is an opportunity to develop collaborative work, because active methods require collaboration and interaction between peers, because it is in interaction that ideas mature and are embodied, in this way knowledge is solidified.

In this sense, working with DT gives us the opportunity to visualize problems, as well as propose solutions, at the same time it allows us to observe what steps will be necessary to reach a possible answer, which is quite challenging. Considering that proposing problem solving is not always something simple to do, however, working with active methodologies may allow us to analyze problems with sharper eyes that, suddenly, would not be so clear. In this sense, using DT for problem solving helps us to know where to start to reach an intended place: to propose creative and innovative solutions.

KNOWING IS NECESSARY: ACTIVE METHODOLOGY / *DESIGN THINKING*

The transformations that society has been going through are notorious, since the advent and insertion of digital information and communication technologies (DICTs) in the various areas that surround us, from the simplest to the most complex, basically, almost everything is crossed by technology, in fact, one can see this transformation promoted by technologies, which swarm in the most diverse environments where we pass. Human relations are no longer the same, it is difficult for this to recede in a globalized technological world. Things are moving forward with unimaginable speed.

In this scenario of profound transformations, everything is different, the way we buy, the way we share; how we learn; And as we study, today, basically, we can find all subjects on digital platforms, which, in a certain way, specialize in producing, literally, knowledge, and not only that, of quality and relevance. Currently, any student with access to the Internet can act directly in their education, autonomously, actively acting in their agency (Vianini and

Arruda, 2020), in addition to a world of complexities and demands, it is what is expected of learners, who act actively, as they are building and solidifying learning. In this direction of active learning, Moran (2018) tells us that we learn...

> "[...] Actively since we were born and throughout life, in open design processes, facing complex challenges, combining flexible and semi-open tracks, in all fields (personal, professional, social) that expand our perception, knowledge and skills for more liberating and fulfilling choices. Life is a process of active learning, of facing increasingly complex challenges" (Moran, 2018, p. 2).

In the same direction, Moran points out that:

> We learn best when we experience, experience, feel. We learn when we make relationships, we establish bonds, bonds between what was loose, chaotic, dispersed, integrating it into a new context, giving them meaning, finding a new meaning. (Moran, 2013, p. 28).

In the face of the context, in which students actively learn from birth, and that we learn by making relationships, giving meaning, then, how to make the training environments relevant to a generation that has everything in the palm of their hands, and who need to see that their learning has a connection with life; Perhaps it is not an easy and simple answer to give, however, one observation is: these environments need to be resignified to meet these new demands, so it has been advocated for a significant time for new practices in classrooms, in which theory and practices are amalgamated, where students are urged to actively act in their training and in the construction of their learning, It is not new that there is a preaching of a teaching-learning that inserts each learner, with their specificities, in this process, as subject-learners responsible for their journeys.

In this step, working with active methodologies is one of the many possibilities to rethink new ways of converting learners into the centrality of this process, because the bases of active methodologies are, according to Filatro and Cavalcante (2018): to make learners protagonists, and by protagonism we understand the responsibility, despite hard work, of each one to build their own trajectory; action-reflection, that is, articulating theory and practice through interaction with the world, learning to reflect on its practices, because when we interact we build knowledge; And finally, collaboration, in a connected world, productions are collaborative, teamwork is indispensable.

With the foundations laid, the work with DT is an active approach that has been influencing various areas of society, as well as education. DT comes from another area of knowledge: from the business world, it is used by companies with the objective of problem solving, and process mapping. It is a methodology with very particular characteristics that

aims to improve ideas, in order to solve a given problem, with creativity, innovation, collaboration and more practical actions.

DT became known worldwide by the IDEO design companies, which invested in this methodology, for the potential it presents, to raise, in a creative and innovative way, transformations in different spaces of society, which favored the adoption of DT by education, as a feasible proposal to propose practices, in which teachers and students can, in a collaborative way, to come up with problem solutions to teaching-learning issues. Why isn't thinking about using DT in education something distant? Because...

> In 2011, IDEO published a specific material for the educational area, systematizing the approach in a didactic way that can be experienced by educational institutions interested in the subject. In Brazil, the first experiences began in 2012 and continue to grow every year, configuring design thinking as a powerful practice for transforming the relationships and daily challenges experienced in the educational locus. (Rocha, Julciane, p.153; in: Methodology for an innovative education, Bacich and Moran, 2018).

Based on these findings, TD is a reality applicable to education, which can be done at all levels, as it is a methodology from which one can reach problems in a creative and innovative way. In addition, it is important to highlight the centrality of people, learning to do and redo; In addition to stimulating creativity, it favors the thought of collaboration and co-creation, and one of the most salient characteristics is empathy. These are some of the main characteristics of DT. From this perspective, Filatro and Cavalcante (2018, p.52) highlight the relevance of working with Design Thinking:

> Design Thinking (DT) is a human-centered approach that promotes complex problem-solving, stimulates creativity, and facilitates innovation. It is humanistic, as it seeks to understand, in an empathetic way, the desires and needs of people impacted by an analyzed problem. (Filatro, Cavalcante, 2018, p. 52).

In line with the authors, when they emphasize that DT is humanistic and seeks empathetic ways to understand problems in which people are involved, this methodology can be thought of as a potentiating approach to teaching-learning. Carl Roger (1980), in the same direction, highlights the importance of this empathy with the learning subjects. For the author:

> Rogers (1985/2017) states that it is through contact that one educates and that the teacher must be an educator-facilitator, a person who is really present for his students. **The educator should not adopt a single model to facilitate learning**, he needs to put the interests of the students first, **this method consists of the student following, learning to learn** and the teacher, being a facilitator of this learning in a unique and free way, with authenticity, acceptance, confidence both in himself and in the student and **empathetic** understanding. (De Lima; Barbosa; Peixoto, 1980, p. 164. In: Rogers Carl. Becoming a Person. Emphasis added).

In view of this, DT is a significant approach to classrooms, which will certainly not solve all the problems intrinsic to these spaces; but it will point a way, for the simple fact of providing an environment, in which there is the opportunity to think, in a more creative way, with a certain freedom, other ways of thinking about problem solving, thus generating an environment whose collaboration and co-creation are pillars, in order to allow the learning subjects to be, at the same time, the center of the process and continue learning to learn, as well as a significant opportunity to learn by doing in an active and autonomous way, abandoning a content-based teaching-learning, without reflection, which does not collaborate with critical thinking.

DESIGN THINKING: SAILING THE SEA OF EXPERIENCE

> "I speak as a person, in the context of a personal experience and learning" (Rogers, Carl).

Dialoguing with the author's epigraph, the work with DT and my own experience in this journey of active, autonomous and meaningful learning, I come to understand DT as a rich opportunity to experience attitudinal learning, in practice, in exchange, in negotiation, a learning in which there is no room for passivity, because more than ever the social context and its complexities seek subject-learners who act decisively in this construction, because learning is a continuous, revolutionary and disruptive act (Hooks, 2017), in which each opportunity is a moment to be and want to do, to be subjects of their own learning, experiences, and to be sure that one learns by doing and redoing, building, reconstructing, signifying and resignifying the way one learns.

In this sense, For Filatro and Cavalcanti (2018), learning by doing is a pillar of experiential learning, in which there should be no separation between education and life, since one learns to make commitments in/with society, consequently, it is a separation that does not make sense, for the simple reason that we are integral beings. Therefore, we need to learn holistically. Because learning should not be separated from life. According to Moran:

> “[...] education is not preparation for life, it accompanies life itself, the development of human beings, their autonomy and learning through experience and reflection on experiences that drives them to establish relationships, become aware, build knowledge and rebuild experience" (Moran, 2018, p. 11).

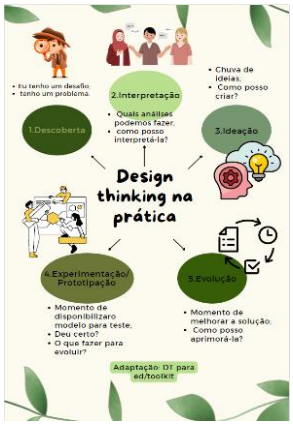
Contributed to the understanding that we are trained for life, it becomes indispensable that we all be instigated – as subjects-learners – more and more to walk on the arid and fertile

land, at the same time, of knowledge, if worked, turned over with depth, it will become a favorable land to germinate it, because just as the earth, undoubtedly, needs to be turned over and fertilized so that, When a plant is placed, it germinates and bears fruit, so is knowledge, for it to grow it is necessary hard work, densification and reflections, so that it gains solidity, and this spreads, expands, since all knowledge has a purpose, we do not learn without purpose or we should not. Moran brings us the following reflection on learning:

> We learn when we discover new dimensions of meaning that previously escaped us, when we expand the circle of understanding of what surrounds us, when, like an onion, we peel new layers that previously remained hidden from our perception, which makes us perceive in a different way. We learn more when we establish bridges between reflection and action, between experience and conceptualization, between theory and practice; when both feed each other. (Moran, 2013, p. 28)

Anchored in an experiential learning that generated reflections and actions between theory and practice, this work was erected. This experience started from a generating problem that the members of the trio received, and needed to solve, and for this resolution the methodology with which we worked was DT. The proposal was: to design a course in a foreign language for indigenous researchers from UFPA, for a communication at COP30, which will take place in the city of Belém.

For the elaboration of the course, it was chosen, among several possibilities of use, of the DT, those that could encompass what was intended, for this, the stages adapted for education were used, it was from these that the work began. For this purpose, the author of this article, for a better understanding of the needs, made some changes in the interpretations of the stages, including some comments, which will be portrayed in the image below, prepared from the original.



Elaborated by Daciléia Ribeiro; Beatriz Dias and Gabriel da Silva, 2024.

In the figure above, the stages of DT are portrayed from different moments, with which we work are: discovery, related to the problem itself; interpretation is the analysis made to

know the problem more closely, and what is already known about it is the initial survey, in order to think of ideas to solve it in the next stage; the subsequent stage, perhaps, is the most important, ideation, for the simple fact that here is a time for conjectures, brainstorming, real possibilities of solutions; the other stage is directly related to the previous one, because it is from what was suggested, decided, previously, that the implementation is started, it is what is known as experimentation, for some authors such as Filatro and Cavalcante (2018) prototyping; and finally is the evolution phase, the time to think and make improvements to the product and/or process.

These were the stages with which we decided to work, although there are others, which will depend on the author with whom we choose to consolidate the DT methodology. We decided to work with the steps mentioned because we understand that they contemplate the proposal to solve the problem that was given to us: to prepare a course for indigenous researchers from UFPA, for a communication at COP30. In the following section, we will relate more specifically how we conceive the course, from where we started to arrive at materialities.

METHODOLOGICAL STEPS: A DISRUPTIVE, CREATIVE AND INNOVATIVE PROPOSAL TO WORK ON LANGUAGE TEACHING

Language teaching urgently needs a change, so how to make it more creative, less content-oriented and more focused on real learning, less "canned" proposed by textbooks, are relevant questions, which every language teacher should reflect on, in order to change their practices. Not without reason, there is talk of working with active methods to enhance the linguistic skills of learners involved in language teaching and learning.

In this context, DT is an excellent opportunity to propose a more interactive and active learning, designed for the development of skills. Perhaps it is not easy to use, but nothing impossible if there is the right motivation. With regard to the teaching and learning of languages, we always have to start from a need perceived in the classroom, in order to involve the students in order to propose a solution. In this case, it arose from the problem that was given to us and we needed to propose a solution, using the DT steps to develop, in a less canned way, an English language course. So the challenge was overcome as we went through the stages of the DT with which we worked. In the elaboration of the course, we experienced the stages mentioned, from the moment we prepared the classes, in order to unite the objective of each class with the five stages of the DT. This is evidenced in the material designed for the course to be taught.

After the course was idealized and the difficulties were overcome, it was time to think about the materializations that were exhibited at the II Fair of Teaching and Creative Learning Practices and Innovation. The activities began with the separation of the trios, which worked together for the exhibition at the fair, each group worked with a specific methodology. The division of the trios was made by the professor of the discipline, who organized them, taking into account the students' backgrounds, in an attempt to group them by area of training, since we are in a multidisciplinary course, in which the students are circumscribed in diversified areas of knowledge.

The approaches with which the groups worked were drawn in the classroom, the problems were previously established by the teacher. From these concatenations, the trios had to propose solutions, anchored in one of the methodologies proposed for this, many of which were addressed in the classroom, others the groups had to seek autonomously to develop the work.

At first, our trio was greatly impacted by the proposed methodology, as we had a very complex problem to propose a solution using DT. To solve the first doubts, we had to look for authors who would support us with theoretical support, which expanded our knowledge about the methodology, densification done, and the phases of TD with which our trio worked were decided. After this choice, things became clearer and more objective, and the work could continue without major complications, when we take the first step, it is natural that ideas flow. After that moment, we began to idealize the course, and how it would be carried out.

So, from the stages of DT, we developed the English course, whose main objective was to prepare indigenous researchers from UFPA, for communication at the event –COP30–. The course was designed from an original proposal by one of the participants of the group, Gabriel da Silva, an English teacher, and has even had the opportunity to prepare other materials for this purpose. For the conception of the course, we started from the established stages of the DT, which was not so simple, however, we managed to idealize the course.

In this case, what could be observed is that one of the great enhancers of DT is the participation of people getting involved in the entire design process, one of the living phases, in our case, was ideation, an opportune moment to exercise creativity and innovation in the way we see or propose solutions to problems, this phase was one of the ones that most allowed us to think about how to develop a course for this purpose; how this would happen; what would be most relevant to address in this course; in what format it would take place; what this materialization would be like. Literally, it was a great opportunity that allowed us to bring out ideas, and think outside the commonplace.

It is important to highlight that we were unable to interview an indigenous researcher to actively participate in the construction of the course; however, this in a certain way, allowed us to ponder many things and, at the same time, exercise the empathy so propagated in this methodology, in addition to taking into account the experience of Professor Gabriel. Thus, we structured and materialized the course and a glossary, because we understood the need for this conception as another materiality to accompany the classes. This glossary was designed with terms that specifically encompass the environment, it is a material under construction, which has the potential to evolve, since it is an experimentation that will need to evolve. In the following section, I will highlight how I was able to work with abstract concepts of creativity and innovation, so that they could be evidenced in the aforementioned work.

DESIGN THINKING: A NEW PROPOSAL TO CREATE AND INNOVATE

> "The answer is obvious: creativity is a kind of mental activity, an insight that occurs inside the heads of some special people. But this assumption is misleading." Mihaly, Csikzentmihalyi (2023)

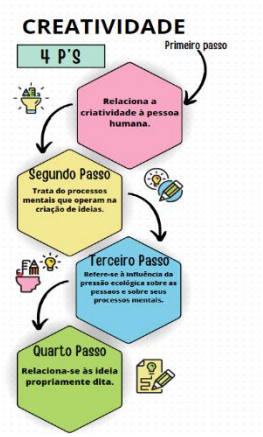
By dialoguing with the author's epigraph, a myth that only some people are creative is dispelled. Therefore, for some authors we are all naturally creative, we are always creating something, and at the same time we are invited to manifest this creativity in everything we do, in the simplest to the most complex situations. Creativity can even arise in a moment of inspiration, but it is almost always the result of hard work, which often requires a lot of time of observation and dialogue with peers, because they are the ones who will validate whether or not something is creative. In addition, creativity goes through processes/stages until it materializes into something, which may or may not be validated as creative. For authors such as (NAKANO; WECHSLER, 2018, p. 238) creativity is "[...] a multidimensional construct, involving cognitive variables, personality characteristics, family and educational aspects, and social and cultural elements".

In this line of thought, if creativity is a multidimensional construct, then everyone has this ability to interact in this creative process, so it cannot be the property of a few, or of the enlightened, each and every human being is born to be creative, to a greater or lesser extent, here comes the cognitive variables of each person. However, one thing is certain, restrictive environments will make it difficult for creativity to manifest. On the other hand, in favorable environments, it will emerge. The environment in which we were inserted made it possible for us to develop this work, because it was a space conducive to exploring creativity and innovation, in order to assume responsibilities in this process.

Although there are several conceptions of creativity, for this work, it was anchored in the concept from the conception of Mel Rhodes (1961),[2] known as the four P's: Person; Process; Environment; and Product, these are for the author, the steps that involve the creative process. When we started this journey, we were driven to reflect on these stages, because we were circumscribed in each of them, and this made us reflect on what the author says when he says: "Dissatisfaction must always be the ingredient of the process". This is because in order to conceive a product or process, with creativity and innovation, the search for answers must instigate us, and dissatisfaction must be part of this journey, because, naturally, we are born with the creative capacity. Perhaps what we need is to be awakened to this.

Not without reason, when we were faced with the challenge of proposing an English course for specific purposes, using DT, the first question was how we will do it, in a creative way, taking into account the steps proposed by Rhodes (1961). This made us reflect on the first part of the process proposed by the author, after all, we were at the center of the creative act, seeking to innovate, as thinking people and, at the same time, divergent at various times, which in a way, favored creativity, since in the multitude of ideas the best solutions emerge.

In turn, the process itself brought us essential reflections, which instigated us to think, how? What for? And for whom? Because, generally, people create a product and/or some solution to meet a demand, or to respond to an existing problem. The environment in the creative act is a decisive factor, because as already mentioned: restricting environments hinder creative work. In this case, we were favorable to design a creative product, using the steps of DT; and finally, after creation, the product will be evaluated whether it is relevant or not. To illustrate the four P's of Rhode (1961) is the figure below:



Adaptation of the original, by Daciléia Ribeiro, 2024

[2] Em livre tradução a partir do original (1961). An analysis of creativity. The Phi Delta Kappan, v. 42, n. 7, p. 305-310, abr. 1961.

These were the steps used to complete the English course. For each stage of the course, we relate it to the stages proposed by the author, from the beginning to the end of the course. This can be better observed in the available material, accessed via QR-code. From the conception of the course, we created some products that were presented at the fair and, later, evaluated by the audience and the teachers who visited the stand.

In this process, an important point to highlight was the motivation to overcome the challenges, this led us to break the barriers when working with DT, proposing a foreign language course based on this active methodology. This allowed us to work designing the materialities as creatively as possible, to present to an audience that, in a way, would be our evaluators. In the end, no one creates anything without a goal, something is always sought, and almost always recognition, even if it doesn't come.

Finally, we thought about what would be exposed at the fair, in all the details, from the class material, to a persona (indigenous), designed to give voice to the indigenous people; who was also the image personified in the banner, which echoed the video created from which we dialogued with the participants, portraying the Amazon, and how everyone needs to take care of the environment.

DESIGN THINKING: GENERATING RESULTS

We come to the results of the exhibition; According to reports from the participants, who were at our stand, they were positive, and in order to obtain more reliable feedback, we prepared an environment entitled "Creative Space", it was a painting whose edges were decorated with handmade plants, made by one of the team participants, those referred to the local culture. The function of this space was designed to give voice to each participant to suggest improvements, give an opinion about the exhibition, and help us expand the glossary, for this purpose post-its and pens were distributed for all participants to write their suggestions and/or opinions and put them fixed on the board, all opinions were positive, congratulating the group for the exposition and explanation, because we explained to our interlocutors how we arrived at the exposed materialities, with which they had contact.

On the same occasion, the participants were able to view all the materials that were made to compose the exhibition, which were left on the table, and each visitor was able to take a flyer with part of the printed glossary and another with the stages of the DT, which was positive, because this way they could have contact with a part of everything we exposed. In addition, the complete glossary was displayed on the table, we also made available the QR codes to access the materials: the course and the digital glossary. In the same space, some people suggested that we expand the glossary, as a product, to possible other works. It is

relevant to highlight that one of the participants of the group produced an informative video, whose function was to give voice to our persona – indigenous – in the video some aspects about the Amazon, biodiversity and the importance of caring for the environment were reported. I share the QR codes for access to the course material and the glossary. All images were designed by: Daciléia Ribeiro, Beatriz Dias and Gabriel Silva.

BOOK CREATOR

Glossário - Meio Ambiente

FINAL CONSIDERATIONS

The experience with active methodologies is an important reflection to be made, and how we can implement them in the classroom, so that learners are effectively active, autonomous, in the sense of what it is to have autonomy, thought from active methods, because, in the education of the twenty-first century, there should be no room for passivity. In an increasingly dynamic and complex world, we need to train critical subjects and, at the same time, who assume their own journeys in the construction of knowledge.

In fact, working creatively and with innovation may not be very easy, because we are taught to depend almost exclusively on teachers, who bring almost everything ready to be digested by the learners, without much questioning, and not only that, we are usually in environments that are not favorable to creativity and innovation; However, the time has come to reframe the way we learn and teach, because we are in two directions, learning for the integrality of life and, at the same pace, forming human beings for life, people capable of exercising leadership in the various areas of life and their own journey, whether professional, personal or academic. Furthermore, we need free formative environments, in which there is freedom for creativity and innovation, spaces where each subject is free to think beyond the commonplace. Divergent environments, in which the point of balance, negotiation and conciliation are found, and thus there is the flourishing of creativity and critical thinking.

In short, spaces where each learner is not afraid to think and expose their opinions, even if they are divergent from the others, in which the exercise of freedom is to exercise

one's own freedom, to paraphrase Freire. In this sense, Bell Hooks (2017) teaches us to be disruptive, in spaces closed to new perspectives, for this we need to resignify the way we learn, because there is no right or wrong way in the learning journey, what there are are different choices that each learner will have to make in this path of knowledge construction.

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