Estilo de aprendizagem em ambiente virtual: um estudo com professores da educação básica em formação continuada
Learning style in a virtual environment: a study with elementary school teachers at in-service training
Estilo de aprendizaje en entorno virtual: un estudio con profesores de educación básica em la formación continua

Eliana Alves Moreira Leite
ORCID: https://orcid.org/0000-0003-2087-1754
Universidade do Minho, Portugal
E-mail: elimoreiraead@gmail.com
José Alberto Lencastre
ORCID: https://orcid.org/0000-0002-7884-5957
Universidade do Minho, Portugal
E-mail: jlencastre@ie.uminho.pt
Bento Duarte Silva
ORCID: https://orcid.org/0000-0001-5394-5620
Universidade do Minho, Portugal
E-mail: bento@ie.uminho.pt
Hermínio Borges Neto
ORCID: https://orcid.org/0000-0003-4854-6953
Universidade Federal do Ceará, Brasil
E-mail: hermínio@multimeios.ufc.br

Resumo
Em cenários de aprendizado, o foco principal deve estar no conhecimento sobre as potencialidades e fragilidades do aprendente. Neste contexto, o presente artigo tem como objetivo apresentar os resultados obtidos na investigação prévia dos estilos de aprendizagem de professores em formação continuada, na perspectiva da elaboração de estratégias que levem em consideração as singularidades do professor/cursista. Esta investigação trata de um estudo de caso sobre professores em curso *lato sensu* na área de Educação Ambiental, em modelo híbrido, com ambiente presencial e virtual, ofertado por uma Universidade pública.

Buscou-se analisar as respostas para promover uma personalização nas atividades da sala de aula presencial e virtual baseando-se em estratégias pedagógicas que contemplassem todos os estilos dos formandos presentes. Para identificação do estilo de aprendizagem foi aplicado questionário aberto, baseado no modelo de Kolb, onde se obteve uma amostra de 57 respondentes, onde se identificou estilos de aprendizagem diversos entre os cursistas. Os resultados apontam que formações elaboradas para o (a) profissional docente que buscam o conhecimento sobre especificidades deste profissional, a partir de instrumentos que valorizem e reconheçam sua opinião, favorecem para que sejam protagonistas da própria formação.

Palavras-chave: Estilo de aprendizagem; Modelo híbrido; Professores; Formação; Ensino.

Abstract

In learning scenarios, the main focus should be on knowledge about the learner's strengths and weaknesses. In this context, this article aims to present the results obtained in the previous investigation of the learning styles of teachers in continuing education, in the perspective of the development of strategies that take into account the singularities of the teacher / student. This investigation deals with a case study on teachers in a broad sense in the area of Environmental Education, in a hybrid model, with classroom and virtual environment, offered by a public University. We sought to analyze the responses to promote personalization in the classroom and virtual classroom activities based on pedagogical strategies that included all styles of trainees present. To identify the learning style, an open questionnaire was applied, based on the model by Kolb, where a sample of 57 respondents was obtained, where different learning styles were identified among the course participants. The results indicate that training courses designed for the teaching professional who seek knowledge about the specificities of this professional, using instruments that value and recognize their opinion, favor them to be protagonists of their own training.

Keywords: Learning style; Blended learning; Teachers; Formation; Teaching.

Resumen

En los escenarios de aprendizaje, el enfoque principal debe estar en el conocimiento sobre las fortalezas y debilidades del alumno. En este contexto, este artículo tiene como objetivo presentar los resultados obtenidos en la investigación previa de los estilos de aprendizaje de los docentes en educación continua, en la perspectiva del desarrollo de estrategias que tengan en cuenta las singularidades del profesor / alumno. Esta investigación aborda un estudio de caso sobre docentes en un curso de sentido amplio en el área de Educación Ambiental, en un

modelo híbrido, con aula y entorno virtual, ofrecido por una universidad pública. Intentamos analizar las respuestas para promover la personalización en el aula y las actividades del aula virtual basadas en estrategias pedagógicas que incluían todos los estilos de aprendices presentes. Para identificar el estilo de aprendizaje, se aplicó un cuestionario abierto, basado en el modelo de Kolb, donde se obtuvo una muestra de 57 encuestados, donde se identificaron diferentes estilos de aprendizaje entre los participantes del curso. Los resultados indican que los cursos de capacitación diseñados para el profesional docente que busca conocimiento sobre las especificidades de este profesional, utilizando instrumentos que valoran y reconocen su opinión, les favorecen para ser protagonistas de su propia capacitación.

Palabras clave: Estilo de aprendizaje; Modelo híbrido; Maestros; Entrenamiento; Ensenanza.

1. Introduction

The training of the teaching professional is under the influence of social, technological, scientific, environmental changes that permeate their surroundings, and imply in the constant resizing of their actions. A well-designed and careful planning for teacher training can directly impact the pedagogical practices of the classroom. Thus, in this scenario of changes, demands and responsibilities of this professional are intensified to employ teaching strategies and methodologies that corroborate for the student's learning with more contemporary biases. Therefore, the insertion of methodologies that provide a more personalized environment for the student's learning has been frequently requested by the teacher. As Moran (2015) refers "education has always been mixed, hybrid, always combining several spaces, times, activities, methodologies, audiences. This process, now, with mobility and connectivity, is much more noticeable, broad and deep: it is a more open and creative ecosystem" (Moran, 2015, p.27). However, for the teacher to take ownership of these changes gradually, his training must also have the support of the hybrid model.

In addition to the requirements surrounding the teacher, as well as regardless of the models organized for his training, whether face-to-face, virtual and / or hybrid, the singularities regarding the individual profile of this professional should be given importance, since he / she himself / herself may be a reference for the training planning that will surround him / her.

In this context, the statement that "teachers as subjects of their own profession are subjects of knowledge is to recognize, at the same time, that they should have the right to say something about their own professional training" (Tardif, 2018, p 240). Against this line,

Pacheco (2017) signals that teachers are invited, or summoned, to do the training, but they are not asked about the training they want. Therefore, it is noticeable the gaps present in relation to the teacher's opinion to collaborate in their training.

It's important to highlight the autonomy of the teacher so that his / her opinion is valid before the pedagogical training that is proposed to them. This time, it signals a document prepared by the teachers on the Common Base National Curriculum (BNCC, 2019), where they do not feel recognized in its peculiarities. The document entitled BNCC: curriculum from the perspective of the working class "... demonstrates that continuing education is a fundamental condition for teaching knowledge to be reviewed, rethought, assimilated in constant dialogue with pedagogical theories with university researchers and, especially among peers themselves" (BNCC, 2019, p.34)

To this end, results from the positioning of teaching professionals may guide decision making for the preparation of their training processes. On the other hand, it is important to make it clear that it is not a matter of limiting training around what the teacher wants, but above all allowing it to be a parameter to indicate constituted and necessary knowledge in the training itself.

In this perspective, when the teacher's opinion is validated in the indication of paths for the training itself, it may bring a more personalized bias, in which its individuality is considered, and through this perspective, it refers to the teacher's learning style when it is found. on student paper. Thus, identifying the teacher's profile may also indicate his teaching practice in the classroom.

Personalizing teaching is not just working with a focus on skills, but understanding that each student learns differently and at different rates (Christensen, Horn & Johnson, 2008).

This article aims to present the results obtained in the previous investigation of the learning styles of teachers in continuing education, in the perspective of the development of strategies that take into account the singularities of the teacher. In this context, it specifically sought teachers in continuing education, in a broad sense course in the area of Environmental Education offered by the Federal University of Ceará. In addition, this article may contribute to management teams responsible for planning teacher training, seeking to know the individual profile of the teacher, as well as potentials and weaknesses.

It's noteworthy that this work is an excerpt from an ongoing study, which gradually emerges in more in-depth research.

This article is organized as follows: section 2 presents the theoretical foundation, especially the concepts related to the style of learning, personalization and hybrid teaching. Section 3 describes the methodological procedures used in this study, while Section 4 presents the collection and analysis of the results. Section 5 presents considerations and recommendations for future researchs.

2. Theoretical Foundation

2.1 Learning styles

According to the Michaelis dictionary, style has as its definition: "a set of characteristics that singularize the appearance of a taste, a behavior, a practice or a custom of an individual or a group". In the field of education, learning style is a process in which each student has his own way of learning. In this perspective, many researches have been focusing on this topic related to students, regarding theoretical aspects and models (Kolb, 1984; Alonso, Gallego & Honey, 2007; Felder, 2005). It is then mentioned that "the concept of learning style has become a popular way of recognizing the uniqueness of the individual learner" (Kolb & Simy, 2008, p.2018). According to Felder (2005), preferences and tendencies that students have in the face of the information presented to them and the way they process and respond to this information in the face of different instructional environments.

When reporting on students' learning styles in educational settings, a concern on the part of authors is demonstrated, such as "improving practices and providing pedagogical actions that are connected to student preferences and reality" (Ota, Araújo Júnior & Barros, 2017, p.53). On the other hand, Santos (2020) when discussing the subject points out to be a way to develop skills for styles that are not preferred by students. Therefore, although the student has his own way of learning, geared to his preferences, the importance of expanding the range of activities beyond his individual preferences is reiterated.

Among the theorists who were presented on this concept, the study in question will have input in Kolb (1984), according to the author "learning style is not a fixed psychological trait, but a dynamic state resulting from synergistic transactions between the person and the environment environment. This dynamic state arises from an individual's preferential resolution of the dual dialectic to experience / conceptualize and act / reflect" (Kolb & Simy, 2008, p.71).

Kolb (2015), formulated the theory of Experiential Learning, as long as he points out that he did not create this theory, but discovered it in the works of important 20th century scholars, "who gave experience a central role in their theories of human learning and development, especially John Dewey, Kurt Lewin, Jean Piaget, Lev Vygostsky, William James, Carl Jung, Paulo Freire, Carl Rogers and Mary Parker Follett "(Kolb, 2015, p.13).

The concept of the learning style was elaborated a posteriori, based on this theory, which consists of an approach to adult development, related to professionalism. Therefore, "the theory of experiential learning is described as learning based on a cycle driven by the resolution of the dual dialectic of action / reflection and experience / abstraction" (Kolb, 2015, p.76) ".

Thus, based on this dual dialectic, and combining these dimensions, *Ibid* (1984) proposed an experiential learning cycle (Figure 1). The learner can evolve in stages within the cycle, according to: conducting experiences while learning, reflecting on these experiences, elaborating hypotheses and applying the experience learned in different situations.

Figure 1 - Experiential Learning Cycle.
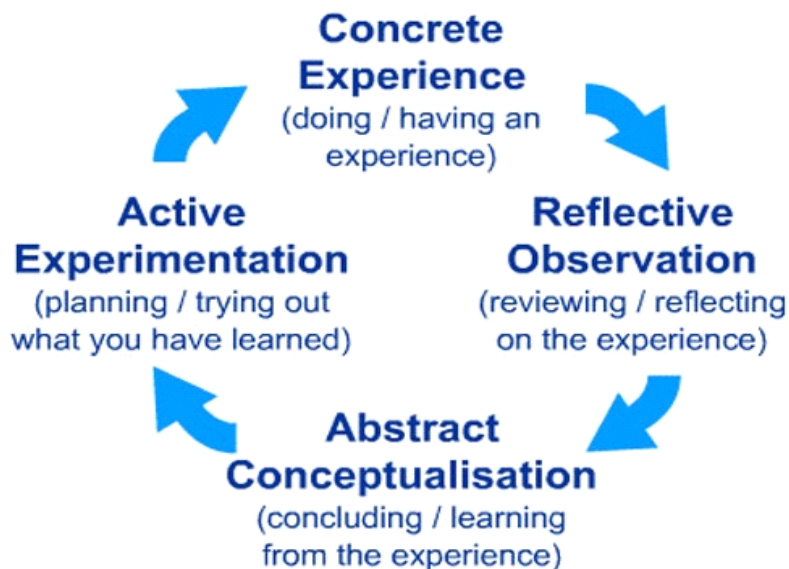
Source: Adapted according to "The cycle of Learning by Kolb (Version 3.1).

Kolb (2015) considers that for learning to be satisfactory, the learner must go through this cyclical movement through the four learning styles. In this sense, the cyclic movement can be mediated by strategies, which allow the student to "experiment, reflect, think and act, not being separate independent entities, but inextricably related to each other in their

dialectical position ... The dialectical dimensions also formed the basis of the concept of learning style "(Kolb, 2015, p.81-82).

From this cycle and combining these dimensions, the author identified four types of learning styles, with the respective most prevalent skills (Table 1).

Table 1 - Learning Styles by David Kolb.

Learning Styles	Predominant Skills
Accommodation - learns through realization, execution and experimentation; it has ease of adaptation and specific immediate circumstances; they seek to adapt what they have learned for their own use, using creativity to change and do better.	Concrete experience (CE) and Active experimentation (AE)
Assimilator - learns through the ability to create theoretical models; is concerned with abstract concepts; inductive reasoning; importance for accurate and solid theories; they use deduction to solve problems and are more interested in the logic of an idea than in its practical value.	Abstract conceptualization (AC) and reflective observation (RO)
Convergent - learns through hypothetical-deductive reasoning; has guidance for problem solving and decision making; practical application of hypothetical-deductive reasoning ideas; they tend to converge or make decisions quickly, look for a correct answer and get to the essentials very quickly.	Abstract conceptualization (AC) and Active experimentation (AE)
Divergent - learns by analyzing reality, integrating theory and practice; has the ability to identify problems and search for solutions can see things from different perspectives and combine relationships into a meaningful whole.	Concrete experience (CE) and Reflective observation (RO)

Source: Kolb (2015).

Model proposed by David Kolb to identify the learning style of individuals is an instrument called Learning Style Inventory (LSI). Based on data from the respondent's answers, in which there is a classification attributed to each answer, it results in one of the most prevalent skills in the learning process of each individual (CE, RO, AC and AE) and indicates the degree to which the respondent prioritizes abstract conceptualization over concrete experience and active experience over reflective observation. This author argues that learning to be successful relates proportionately to well-planned strategies according to the proximity of the reality of its learners (*Ibid*, 2015).

In this study the students are teachers in training. Therefore, when pedagogical teams and teachers have information about the students' learning style, they can promote activities that favor the performance of other skills, in addition to those that already have potential.

It is also noteworthy that identifying learning styles is not intended to label the student, but rather it is a direction for orienting strategies that can be developed for the design

of a course, for example. In this case, this study identified the styles of teachers / course participants in the training process to corroborate with a hybrid and personalized model. The following topic addresses personalization and hybrid teaching.

2.2 Personalization and hybrid teaching

The Distance Education modality has been used as one of the possibilities for teacher education, whether from the perspective of initial or continuing education. Distance education processes, which are not recent, historically, have been used in various periods of the training of this professional, supported by the most prominent technological resources of each era, such as printed material, radio, television and more currently with resources contemporary technologies, with the contribution of Digital Information and Communication Technologies. The distance learning modality with the use of Technologies has advanced to other formats, such as online learning, online education, hybrid teaching (blended learning). However, Silva (2001) states that in order for learning to be sustained by technological means, these resources are not enough. According to this author, it is necessary above all "understand the arrival of the time of these technologies that allow to move from a model that favors the logic of instruction, transmission and memorization of information to a model whose operation is based on the collaborative construction of knowledge, on opening to social and cultural contexts, to the diversity of students, their knowledge, experimentation and interests. (*Ibid*, 2001, pp. 857).

Corroborating, still with the same context, authors point out that "with the advances in technologies and, however, in virtual teaching environments it is essential that the focus falls on how the teaching and learning process will take place, which methodology to use and not only in the technological apparatus "(Xavier, Araújo, Torres, Borges Neto & Nepomuceno, 2018, p.3).

The preparation of training courses for teachers, using technologies, does not minimize care in relation to careful planning, since the multiple subjects who are in this process have the most varied ways of dealing with learning. A greater understanding of the participants of a course may favor decision-making about the appropriate procedures, whether related to the learning processes, the methodologies, the most appropriate strategies.

Hybrid teaching has been a possibility for the training of the teaching professional, since the flexibility in terms of time, place and pace, can corroborate to better manage their training. The definition of hybrid education "is a formal education program, in which a

student learns, at least in part, through online teaching. In this modality, the student exercises some kind of control over time, place, path and / or pace, and the activities are carried out, at least in part, in a supervised physical location away from home" (Horn & Staker, 2015, p.53).

In the perspective of the elaboration of "hybrid or mixed courses ... they also use a pedagogy that places the primary responsibility of learning on the student, with the main role of the teacher being to create opportunities and environments that promote the personalized and collaborative learning of the student" (Lencastre, 2017, p.214)

In these hybrid scenarios, face-to-face moments can enhance the physical presence between course participants and teachers, providing opportunities for exchanging experiences, solving doubts and expanding theoretical and practical knowledge. Activities already carried out online, when the pairs are together in person, "time in the classroom is no longer spent assimilating raw content. Instead, while at school (or university, emphasis added), courseworkers practice problem solving, discuss issues or work on projects" (Horn & Staker, 2015, p.43).

On the other hand, in virtual moments, the sharing of ideas can continue to complement each other and take a more systematic bias in the scope of discussions, where everyone can learn about the opinion of the other, the difficulties, organization of ideas, the construction and deepening of knowledge. Thus, the environments are complementary.

The virtual environment can encourage the participant's active participation, since in the presence moments he may not have had enough opportunity to express his ideas. "Exchanges and interactions extend from the classroom to the virtual, just as the time for these exchanges and interactions expands to any day and time (Behar, 2009, p.181)

The expression "hybrid education is rooted in an idea of hybrid education, in which there is no single way of learning and in which learning is a continuous process, which occurs in different ways, in different spaces" (Bacich, Neto & Trevisan, 2015, p.51-52).

Therefore, as already exposed, knowledge about the professional and personal realities of teachers in training is important, since situations that are close to their realities can be problematized, as well as bringing other experiences that cause changes in the way of experimenting, reflecting, think and act. In this context "the issue is complex, since [...] any educational action must know and consider the characteristics, conditions of study and needs of students [...]" (Belloni, 2001, p.14).

Therefore, getting to know professionals in their attitudes and preferences can corroborate to favor them in their individual and collective learning, as well as recognizing

weak points, and enabling teachers and the pedagogical team to collaborate to invest in these gaps.

It is noteworthy, although in pedagogical strategies planned for a virtual environment, such as a forum, in which interactions can occur collaboratively, it is possible to perceive the individual style of each one through their posts. To this end, "collaboration does not aim for uniformity, since it respects students as different individuals, who in heterogeneity produce and grow together" (Torres, Alcântara & Ilara, 2004, p. 12).

In this investigation it is understood that the teacher, as a critical and reflective individual about his own formation, an active and fundamental participant in education, his opinions and needs must be taken into account.

Thus, regardless of the format that the teacher training is in person, virtual or hybrid, it is necessary, through your voice, to ascertain the reality of the investigated. In the following section, the methodological procedures used in the work are presented.

3. Methodological Procedures

The present research, as far as nature can be defined as qualitative (Creswell, 2014; Pereira et al., 2018) and with support in the case study design (Yin, 2001; Pereira et al., 2018). According to Yin (2001), the preference for the case study should be given when studying contemporary events, in situations where the relevant behaviors cannot be manipulated, but where it is possible to make direct observations and systematic interviews and accordin to Pereira et al. (2018) the case have to be described in detail.

The research was carried out with professors / students of the Specialization course in Environmental Education offered by UFC in agreement with the Secretary of Education of the State. 133 teachers / course participants were enrolled in the course, through selection by public notice. The selected teachers / course participants belong to the Basic Education framework of the public network, from the most diverse municipalities in the state of Ceará.

The specialization course in Environmental Education, started in 2017 and concluded in 2019, as one of the actions proposed for continuing education of basic education teachers, based on the goals of the National Education Plan (PNE, 2014). The course was supported by goal 16, which aims until 2024, "to train, at the postgraduate level, 50% of basic education teachers, and to guarantee all basic education professionals continuing education in their area of performance, considering the needs, demands and contextualization of education systems (PNE, 2014).

The course in its Political Pedagogical Project (PPP), aimed to address the essential issues for the development of environmental education in schools and communities, considering global changes and the construction of sustainable spaces. As well as, it also sought to provide continuing theoretical-practical training for teachers / course participants, with an emphasis on promoting schools and communities that would enable sustainable educational spaces.

The course was implemented in a hybrid model (b-learning), planned with classroom and virtual scenarios. The face-to-face moments took place on the University Campus, considered to have sufficient infrastructure to meet the needs of students.

To promote interactions between participants in a virtual setting, the course was implemented on the "Moodle (Modular Object Oriented Dynamic Learning Environment) platform, making use of educational digital resources and synchronous (chats / chats) and asynchronous (forums, portfolio, wikis, quizes)" (Figure 2).

Figure 2 – Discipline of the Environmental Education Course.

Source: http:/www.helpclassonline.com.br.

The curricular matrix was composed of seven (07) compulsory subjects, with a workload of 432 class hours, of which 160 classroom hours are classroom and 280 hours classroom in the virtual environment (Table 2).

Table 2 - Curricular Matrix of the Specialization course in Environmental Education.

Living Rooms	General workload	Number of hours: theoretical and practical
Introduction to the Course and the Virtual Environment	48h/a	16 h/a - theoretical 32 h/a - practices
Environmental Discipline, Subjects and Identities	64h/a	32 h/a - theoretical 32h/a - practices
Panorama of Environmental Education in Brazil	64h/a	64 h/a - theoretical
Instrumentation for Environmental Education and Interdisciplinary Practice	64h/a	64 h/a - theoretical
Sustainable Schools	64h/a	64 h/a - theoretical
Research/Intervention Projects	96h/a	32 h/a - theoretical 64h/a - practices
Research project	32 h/a	20 h/a - theoretical 12h/a - practices
TOTAL	432h/a	

Source: Pedagogical Political Project.

Kolb (2015) suggests several approaches and activities for learning environments that teachers can use to accommodate students' varied modes of learning, according to the learning cycle. In this context, to support teachers in the planning of subjects, a series of activities were suggested that would reference the learning process of course participants in the face-to-face and virtual scenarios (Table 3).

Table 3 - Activities proposed for the flow of the experiential learning cycle.

Learning Cycle	Suggested activities
Concrete Experience	- addressing real situations; - analysis of situations for decision making;

(experimenting)	- analysis of a concrete situation from different perspectives; - case study approach.
Reflective Observation (reflecting / examining)	- reading articles for discussion and reflection; - presentation of audiovisual resources (films, music, documentaries) for discussion and reflection; - critical opinion formulation; - Observation of situations from different perspectives.
Abstract conceptualization (explaining / thinking)	- reading texts to obtain theoretical concepts; - application of activities using ideas, logic and concepts; - elaboration of systematic planning of a situation.
Active Experimentation (doing / applying)	- emphasis on the application of practical situations; - elaboration of projects to be applied in the school and / or communities; - application of knowledge in situations in the context of environmental education.

Source: Adapted by the authors of Kolb, D.A. Experimental Learning: experience as the source of Learning as and development. New Jersey: Pearson Education, 2015. Second edition.

In addition, through these suggestions, teachers could have the flexibility to go beyond the indications proposed in the course design, as they had the autonomy to manage other assumptions that they considered essential for the students' learning. The constituent elements of the elaboration of the disciplines by the teachers were presented in a Pedagogical Matrix and instructional Design (PDI Matrix), containing general data of the discipline (menu, objectives, program content, academic information, pedagogical and technical staff), didactic-pedagogical planning of classroom and virtual environments, educational and digital resources used (Figure 3).

Figure 3 - PDI matrix of a discipline.
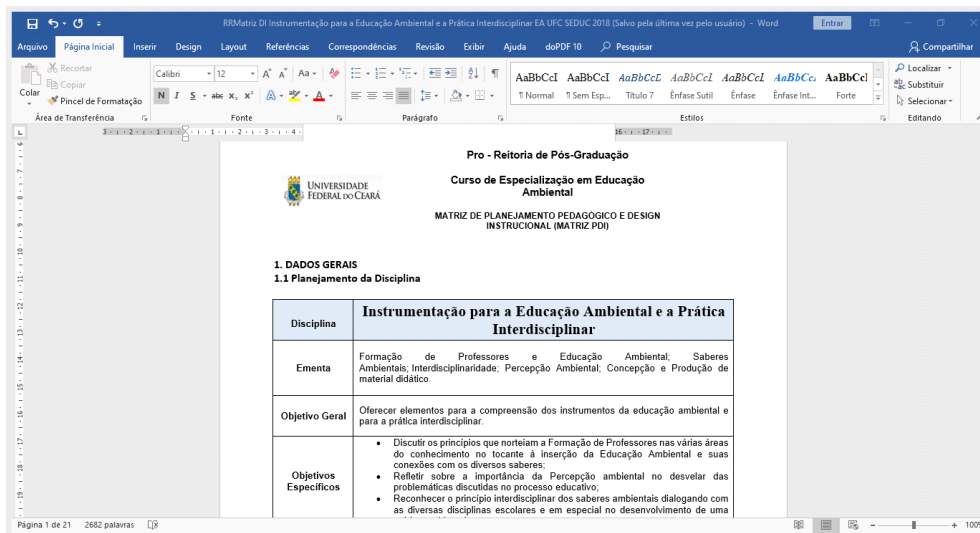
Source: Prepared by professor of the discipline

In the face-to-face class, the PDI Matrix was presented to teachers / course participants so that they could have knowledge about the teaching and learning process that would guide the course, as well as make suggestions and ask questions. Thus, the construction of knowledge among peers did not occur in a vertical way, but always in line with those involved in the process, since teachers / course students have sufficient prior knowledge to also collaborate with their training.

The course had the support of a teacher / tutor in each virtual room to establish mediation, favoring space for the construction of ideas, participation, collaboration and interaction. The pedagogical team and teachers of the course remained attentive and in constant contact to ensure that the students felt supported and with a sense of belonging to the group. The contacts took place through electronic mail (email), specific to the specialization, and also through the WhatsApp Messenger messaging application, in which teachers and course participants formalized groups to establish discussions relevant to the course.

For this study, a questionnaire was applied to 57 teachers / course participants who were present at the time of a face-to-face meeting and who voluntarily accepted to participate in the research. Of these 57 course participants, 50 questionnaires followed for analysis and seven respondents did not answer according to the criteria established for the answers. It is noteworthy that there was no criterion for choosing to apply the questionnaire, all course participants present could answer. The percentage of data collected for the research corresponded to 42.8% of the total of 133 course participants, considering that this percentage was successful. According to Marconi & Lakatos (2010), a data collection instrument is

considered low, when the return of respondents is around a percentage of 25%, however the result obtained in this study was above this percentage.

The questions in the questionnaire are open and comprised of 12 questions, each question with 4 alternatives where the respondent assigns a score from 1 to 4 according to his / her in relation to the proposed questions. For this, 1 is assigned for lesser affinity and 4 for greater affinity, as well as values 2 and 3 must also be assigned. As an example, the question that follows, adapted from Kolb (1993) brings the following question "while I learn": I open myself to new experiences (); I examine all the angles of the question (); I like to analyze things (); "I like to test things (). It is noteworthy that there are no right and wrong answers, but the personal opinion of each respondent.

As for the seven respondents who did not follow up for analysis, it was due to using a single option mark for the answers to the questions, however the procedure should use the numbering from 1 to 4, as explained previously.

For Kolb (2015) "one word in each item corresponds to one of the four learning modes, according to concrete experience (sample of feeling word), reflexive observation (observation), abstract conceptualization (thinking) and active experimentation (execution)" (p .130).

Respondents were informed about the relevance of this study and voluntarily filled out the Terms of Consent and Free Clarification (ICF). The research was approved by the Ethics and Research Committee of the Federal University of Ceará, filed under number CAAE: 03340818.9.0000.5054.

As for the Kolb inventory (2019), authorization was requested to apply the questionnaire to the research committee of David Kolb, and approval was obtained for free access to the LSI version 3.1 on paper.

The research maintains confidentiality related to teachers / course participants and will be treated by the letter P, followed by a number to differentiate them and the letters A, B, C, D or E, referring to the rooms that were selected.

4. Collection and Analysis of Results

With the application of the Inventory (ILS) proposed by Kolb (2019) to teachers / course participants, four learning styles present in the group were identified: accommodating, divergent, convergent and assimilating. The points represent the learning styles of the teachers / course participants (Graph 1).

Graph 1 - Learning styles of teachers / course participants.
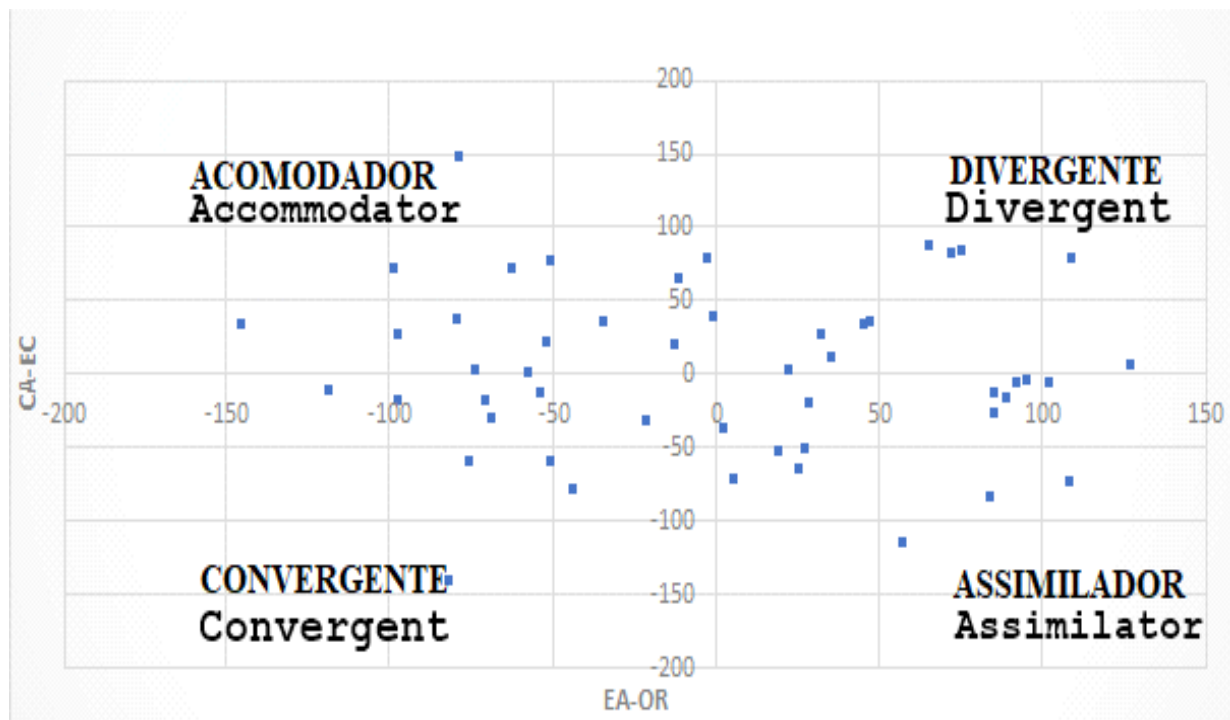
Source: Elaborated by the authors

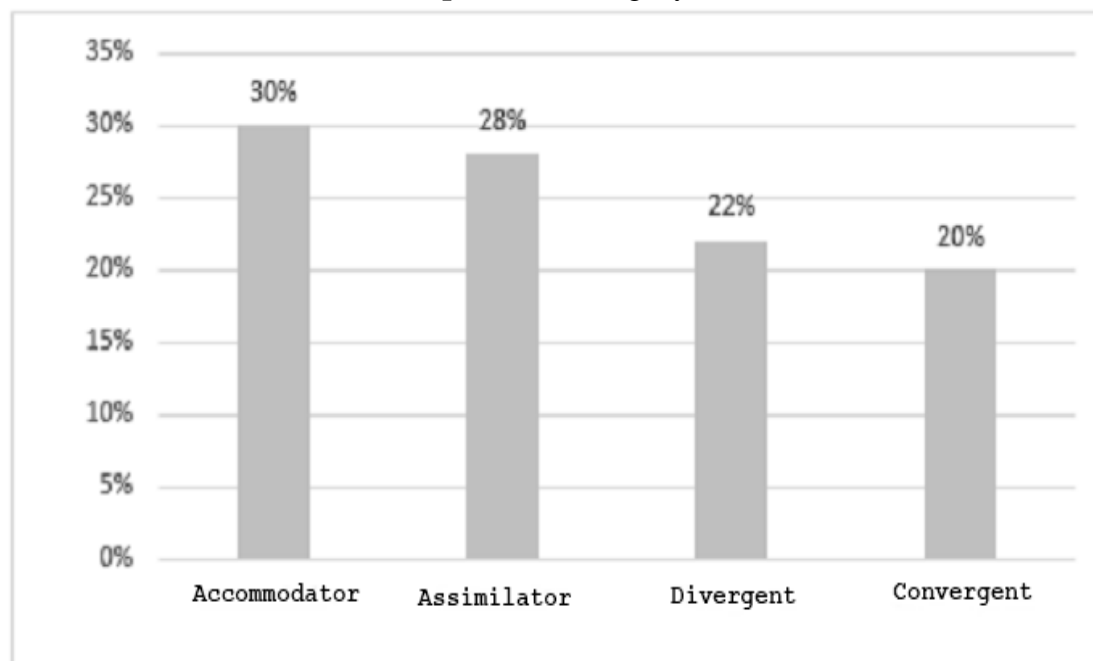In percentage data, the highest concentration of teachers / students falls in the accommodating and assimilating styles, respectively, and in a lower concentration, convergent and divergent styles are shown (Graph 2).

Graph 2 - Learning styles.

Source: Elaborated by the authors

The obtained data were guiding for the planning of the course, since the identification of the learning styles of the teachers / course participants had the intention of recognizing and valuing the individualities present in the group. However, it is noteworthy that this identification did not favor a learning style with a higher concentration index in the group, nor did it devalue the group with a lower index. The activities developed for the hybrid scenario included the different styles of teachers / course participants.

For the planning of classroom environments, lectures were presented with a reflective and theoretical approach on various subjects related to Environmental Education. In this context, the skills of abstract conceptualization and reflective observation are approached with more emphasis, and thus are directed to the learning style of the teacher / student who has a more indicative profile as "assimilator".

In the face-to-face moments, teachers / course participants, speakers, pedagogical staff and teachers who accompanied the course participants, had spaces for exchanging experiences, sharing experiences of the realities of the classroom and communities, as well as raising doubts and difficulties experienced in the training. .

In one of the face-to-face meetings, one of the pedagogical strategies used digital resources, such as, for example, the use of the *smarthphone* for the knowledge and learning of educational applications *(App)* and one of these was the *plickers*[1] application. This strategy could include teachers / students with reported skill plus active experimentation, contributing to students who had a accommodating and convergent style. On the other hand, it also favored learning styles in which these skills would also need to be developed.

The activities of the virtual environment were supported by forums, portfolios, online questionnaires (quizzes), collaborative texts (wikis), glossary development and others. As for the elaboration of the forums, these provided reflective situations, and at other times they made it possible for the teacher / student to talk about the practice in the daily life of the school, classroom and community. The forums allowed teachers / course participants to present their reflections, desires and experiences among peers, as well as, the relationships of interaction could provide collective knowledge.

To exemplify, a forum and portfolio designed for the discipline "Instrumentation for Environmental Education and Interdisciplinary Practice" is presented. The forum (Chart 3)

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[1] Plickers in na aplication for mobile devices, which allows the teacher to elaborate and apply selection activities, which allows the teacher to scan with cellphones as responses and identify in real time or group level related to a content.

covers situations that asked the student to reflect and argue, bringing the ability of reflective observation. In addition, the forum's proposal also requested that course participants seek experiences from their own communities to include in their practices. This activity resulted in an activity that also included the ability of concrete experience.

Table 4 - Forum designed for the discipline.

Forum: Dear student, watch the video by Antônio Carlos Sant`Ana Diegues https://www.youtube.com/watch?v=mpEwpk1LhcI and read the available texts. As for the video, it presents some important reflections, such as the view that environmental education is much more materialistic than culturalist. In this sense, present your opinion on these reflections and argue how it would be possible to reframe the training of environmental educators in a perspective that could receive their experiences from communities instead of taking ready concepts and the transmission of techniques. Share and discuss your ideas with your colleagues; Predominant skills: RO and CE; More comprehensive learning style: divergent.

Source: PDI Matrix.

In this context, the predominance of these two skills, RO and CE, is more strongly related to the divergent learning style. However, the ability of reflective observation also refers to the assimilating learning style, and thus also favors the teacher / student who has this style. As for the skill of concrete experience, it turns to the learning style that has an accommodating profile. Therefore, in the same activity it is possible to contemplate different learning styles

In relation to this forum, teachers / course participants with divergent learning style, present excerpts from their speech:

P1B "This reflection reminds me. a phrase that I always heard from my teachers, even when specializing in some of the meetings we had throughout the course, about how there is an exchange of knowledge and how "we learn more with our students than they do with us". In a field class, for example, in a place known to us only through books and photos, a native, teaches us a lot, or even teaches more, because they have the knowledge of the experience, which takes us a little longer to acquire".

P2A "Environmental education is a 'discipline' which, in addition to being multidisciplinary, is not necessarily part of theory for practice. In this sense, the

resignification of the training of the environmental educator to receive their experiences from the communities instead of taking concepts, could occur with the insertion of the environmental educator in the reality of the communities".

As for the P1B and P2A approach, both teachers / course participants indicate in their speeches, the ability of CE, when they report that communities can bring elements to resignify professional training, bringing aspects of concrete experience.

As for portfolios, activities for individual elaboration, bring a context for a positioning and personal reflection.

In this sense, an example of the portfolio (Chart 3), it proposes to the student to use the reading of the texts and through these readings to highlight concrete experiences, which can be approached in practical situations. This activity also associated active experimentation, as it sought to adapt the significant points selected in the readings to promote actions in practice. AE and CE skills are prevalent in the accommodating learning style.

Table 5 - Portfolio designed for the discipline.

Description / Statement:
Dear student, the formation of a teacher or a professional for environmental education needs to go beyond specific actions experienced in schools and / or communities, such as, for example, environment week. In this perspective, read the proposed texts and describe significant points for the formation of the teacher (a) or the professional who will act in environmental education in the perspective of effectively legitimizing continuous actions in their praxis. Your text may present an image that meets your eyes on these actions; predominant skills: AE and CE; more comprehensive learning styles: accommodating.

Source: PDI Matrix

As for the portfolio activity, teachers / students with a learning style more oriented to the style of accommodator, present this opinion:

P3A "training should stimulate a critical-reflexive perspective, which provides teachers with the means of autonomous thinking and which facilitates the dynamics of participatory self-training. Continuing training involves a series of actions that are carried out in the daily lives of teachers and constitute activities of their practice daily".

P4E "The work of the environmental educator in his education is permanent in view of his responsibility and always requires a process of reflection and action. In this way, environmental education aims to awaken in the human being the collective sense that must be superimposed on the individual. to awaken critical sense and change attitudes in the face of irresponsible attitudes that must materialize in ethical and cultural changes ".

In the speeches of teachers / course participants P3A and P4E, it is possible to observe traces of a learning style that moves towards an accommodating profile, since they propose that the training takes place in a participatory manner.

In relation to the P4E teacher / student, he points out that training, in addition to reflection, also requires action. Teachers / course participants have the ability of active experimentation (AE), which is very present in their positions, since this ability corroborates with practical applications, emphasizing the performance of actions.

To gain insight into the awareness of the teacher / student about their own training, a forum was created (Chart 4), for the discipline "Sustainable Schools" that expresses what they perceive in relation to the training process that has been adopted in the course.

Table 6 - Forum designed for the discipline.

Description / Statement:
Dear student, read the statement below:
For Santos (2012) the continuing education of teachers in Environmental Education is seen not only as complementary to the initial education, but as part of a necessary and indispensable process for the teaching function of knowing how to teach [..] (Source: Revista Brasileira de Educação Ambiental , Revbea, São Paulo, V. 11, No 4: 42-59, 2016.)
Now discuss with your colleagues, if this specialization has been a space of formative praxis capable of transforming it into a "seed" where it can be a mediating symbol of transformation in your classroom making the student a protagonist beyond the school walls, as well as if it has been seed in other places where you work.

Source: PDI Matrix

In this context, examples of messages from teachers / course participants are presented, referring to the forum explained in Chart 4, which punctuate reflections on the

training path itself. In the report of course participants P5C and P6C, their perceptions are evident, namely:

P5C "So far, and without a doubt, all the knowledge made available by this course has been fundamental for the improvement of my teaching practice as an ecological subject committed to a better world. The next step, I hope to develop and put into practice, projects and actions aimed at a more democratic EA and widespread in the schools I work in and in the surrounding communities ".

P6C "It is evident the benefits that this specialization has as a space that fosters discussions and learning, since the texts, the ideas of colleagues contribute not only to reflection, but to improve practice as a teacher, as we see how often comfort takes over the profession and forget that being a teacher is a being of transformation and that he assists and contributes to the transformation of being a student ".

In the speech of the P5C student, it is evident that the course is improving its practice, since it states that "the next step will be to develop and put into practice projects and actions aimed at Environmental Education". As for P6C, he considers that specialization is a space to foster discussions and learning, as well as texts and colleagues contribute beyond reflection, but to "improve teaching practice that can be taken care of with ease".

Therefore, the learning styles of the P5C and P6C course participants have as a striking feature a style for the action skill. Thus, the interactions present in the forum can also contribute to changing attitudes of course participants who do not yet have this skill, based on examples from peers.

The reports of teachers / course participants P7E and P8A also related to the Chart 4 forum, follow below:

P7E "We find here, in this virtual environment, therefore, an extremely fertile field for our praxis of educators who see in Environmental Education an important vector for the transformation of consumer society. At school or outside it, as educators, our practices have to match environmental practices sustainable in order to sustain our speeches and combine theory and practice. Our students need to be sensitized and need to realize that our speeches share with our sustainability practices and they need to be encouraged to be protagonists [..] ".

P8A "This specialization is being of paramount importance for my learning as an educator, making it possible for me to develop various actions with students, as it allows students to have knowledge about existing environmental issues, these actions in addition to serving as a strong instrument of Environmental Education and awareness for students in the sense of referring to the importance of the school space in which the student can make connections with the formal content, changes in the students' view of the environment making them become multipliers ".

Regarding the P7E and P8A course participants, they make it clear in their posts that they develop actions with students, in the search for them to be protagonists and multipliers of environmental issues. It highlights the link they need to establish between theory and practice.

When analyzing the textual contributions of teachers / course participants posted on this forum, presented by the five classes of the course, the word "practice (s)" was the most reported in the messages. Therefore, the relationship between the number of messages posted and the frequency of the word "practice" can be seen below (Table 7).

Table 7 - Relationship between the number of forum messages and the frequency of the word "practice" in classes.

Class	Number of students	Number of messages	Frequency of the word "practice" in messages
Class A	22	47	27
Class B	14	44	22
Class C	20	40	37
Class D	21	26	11
Class E	17	39	33
Total	94	196	130

Source: Elaborated by the authors

As for the frequency of the word "practice", it is clear that it was highlighted in the messages of teachers / course participants, in which it can signal that attitudes and actions corroborate it as relevant to the training process. In this context, the teacher / student with an accommodating profile predominates, who has the most expressive active experimentation ability. However, it may have made it possible for learning styles that have a more theoretical or reflective tendency to have also awakened to a professional practice more focused on practice through the sharing and testimony of the group's statements.

5. Final Considerations

This article aims to investigate the learning styles of teachers in continuing education to develop strategies that consider the singularities of the teaching professional.

The learning styles identified allowed the pedagogical team and teachers responsible for the course management to have knowledge about the public in training. It is understood that the main subjects in the training process must be considered in the planning of the course so that the learning strategies developed are balanced and are able to meet the intended objectives. The identification of the learning styles of the teachers / course participants allowed the hybrid learning scenarios to be planned through the skills of experimentation, reflection, observation and action. The planning of activities could take place in balance, not overestimating one learning strategy to the detriment of another. The hybrid model course became more personalized, adjusting the course participants' strengths and weaknesses. The investigation of the individual profile of the student was relevant to contribute to the design of the course designed for his training, since this study corroborated for a planning where specific characteristics of the teacher were considered.

The learning styles were promising in the course design, however the adjustments in the course were occurring as other needs arose, which could outline significant elements for better performance in training, since it is not possible to trace a linear and predictable path in situations of learning.

Knowing the course participants in advance resulted in outlining the learner-centered training process, with flexible learning situations and not in order to delimit a static and verticalized learning scenario. The hybrid scenario facilitated the course participants to be seen in different contexts, in a virtual and in-person environment.

The collected results made it possible to elucidate learning strategies, which privileged the knowledge and experience of these professionals, as well as helping to remedy gaps that needed to be reframed in this training. Regarding the contributions of this study, it is highlighted how relevant it was for the pedagogical team and teachers of the course to have prior knowledge of the students' learning style, since it allowed to analyze and choose more appropriate learning strategies, as well as to resize others to promote the weak points that hinder the learning process. Therefore, pedagogical teams responsible for the formation of the teaching professional must question what the teacher expects from his formative process, what are his interests, doubts, perceptions, expectations.

It is hoped that these actions will provide training for the teaching professional with scenarios closer to their experiences in the classroom and their surroundings, bringing contexts in which they are seen within the individual and collective specificities, so that they feel valued and recognized, the from his speech and opinion, ceasing to be a mere passive breeder, as if in training.

The challenges are much greater to develop a course with a more personalized design, but in view of the proposed study, it was a strategy that collaborated to meet the needs of teachers in training, causing more flexibility to the individual learning pace.

The research was limited in terms of results, since despite the number of teachers / course participants investigated, it was a sample that was successful, but it is believed that a sample with a larger number of respondents could corroborate with more relevant information about the subjects training.

It is recommended, as future work, that further studies of prior investigation take place regarding the individual profile of the teaching professional in the perspective that training courses are elaborated, valuing particularities and the teacher's opinion about their own training.

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Percentage of contribution of each author in the manuscript

Eliana Alves Moreira Leite – 60%

José Alberto Lencastre – 20%

Bento Duarte Silva – 10 %

Hermínio Borges Neto – 10 %