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MICROCREATIVITY WITH CHAT GENERATIVE PRE-TRAINED TRANSFORMER: LEARNINGS IN VIRTUAL SPACE

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Abstract

The Chat Generative Pre-trained Transformer (ChatGPT) is an artificial intelligence technology that engages in dialogue with humans, capable of generating formulations in the form of micro-narratives that can be problematized as a learning tool in the virtual space. This research aims to understand how ChatGPT can be used in teacher training as a didactic tool to facilitate learning in the virtual space through micro-narratives. We conducted a qualitative study using an action research approach with Brazilian students from the Graduate Program at the State University of Ceará in Brazil. The research consisted of five phases: diagnosis, which involved a mixed questionnaire to assess prior knowledge about generating micro-narratives using ChatGPT; action planning, which involved developing a training plan; implementation of the action, which included practicing the use of ChatGPT to generate micro-narratives and working with them in a didactic perspective in the virtual space; evaluation, which involved sharing the micro-narratives and engaging in circular discussions about them; and learning, which involved documenting the educational possibilities and limitations of micro-narratives. The results, processed using IRaMuTeQ, showed limited prior knowledge about ChatGPT and the importance of micro-narratives for educational work, as well as their fruitful pedagogical use for learning in the virtual space through conscious utilization.

Keywords – ChatGPT; Virtual space; Micro-narrative; Postgraduate; Educational technology.

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1. Introduction

The Chat Generative Pre-Trained Transformer (ChatGPT) is a computer program based on Natural Language Processing (NLP) models, which uses artificial intelligence to create dialogues simulating human dialogue. This new tool developed by OpenAI, since its launch in November 2022, has caused a lot of

controversy in the academic environment due to the tension among professors when higher education students use it to prepare non-authorial works.

According to Qadir (2022), ChatGPT generates and presents completely new content in a real-time conversation with the user. Furthermore, it can maintain a consistent dialog style that engages the user more realistically rather than providing irrelevant answers to every question. This makes ChatGPT a more unique model than other language-wide models (LLM). However, it is important to consider the possible threats – for example, the integrity of texts and their varied genres – along with the many positive applications of ChatGPT for education. Therefore, it is important to rationally assess the educational situation and prepare an adequate didactic plan in the presence of emerging tools such as ChatGPT for its use in the university environment with responsibility and ethics.

Among the several textual genres, the micro-narrative, according to Andres-Suaréz (2010), is a literary subgenre in prose, whose fictional articulation is structured by condensation and narrative fragmentation as its essential elements. Its emergence, development, and consolidation, both in the commercial-editorial public space and in the academic field, has become, in the last two decades, a contemporary genre in several Western and Eastern literature, especially in the Hispanic field.

During the 20th century, micro-stories coexisted with other forms of hyperbrevity, with other micro-texts such as micro-essays, fables, anecdotes, cases, etc. However, in the 21st century there has been an increase in their use and a trend towards the production of books made up exclusively of micro-stories. Thus, the micro-story has become a real cultural phenomenon in Spain, for example, and in a relatively short time has managed to establish itself as an independent literary genre, recognised by both the reading public and critics (Andres-Suaréz, 2015).

The micro-narrative has great potential as a pedagogical resource since its brevity and conciseness enable one to explore the narrative structure, literary creativity, and the synthesis ability of the students in an intense way, for example, they are exposed to a literary text that requires a meticulous analysis to be understood (Andres-Suaréz, 2010). That is, students need to study the text carefully and understand the story based on previously acquired knowledge. For Cogollo (2012: page 49), "this whole process provides elements of analysis and interpretation that are valuable when working with literary texts and that, therefore, can benefit the development of literary competence". Its concise nature also enables the incorporation of the genre into creative writing activities, encouraging students to experiment with different storytelling techniques and improve their writing skills.

In this research, we explore the use of these two innovative tools as a pedagogical resource in higher education, more specifically in teacher training courses. In this way, the micro-narratives generated by ChatGTP are the highlighted object of study. This interrelation became possible because ChatGPT can generate micro-narrative formulations that can be problematized as a learning tool in virtual space. This ability to create brief narratives opens up a wide range of pedagogical possibilities, allowing students to explore concepts, develop critical analysis skills, and interactively improve their written expression.

By using ChatGPT as an educational resource, within the scope of emerging technologies applied to university education, students can actively engage in the creation of micro-narratives, stimulating their creativity and imagination. They can explore diverse themes, create characters, develop intriguing plots, and experiment with different narrative styles. This happens because the interactive nature of ChatGPT allows university students to share the generated narratives, problematizing them and exploring issues such as narrative structure, language use, and character development. This critical and reflective approach contributes to the development of methodologies that develop literary analysis and critical thinking skills that are essential in the learning process (Nascimento, 2019).

In the virtual space, ChatGPT offers the advantage of providing a flexible and accessible learning environment, allowing students to participate in writing and discussion activities anywhere and anytime. In addition, the use of ChatGPT as a learning tool promotes students' familiarity with artificial

intelligence and natural language processing technologies, skills that are increasingly relevant in the digital world.

The implications concerning the use of ChatGPT in the educational context necessarily refer to the teacher training since the educational configurations arising from technologies based on artificial intelligence are in an accelerated course and teachers who are not proficient in these new incorporations can be replaced by those who manage them with competence (Ivanov & Soliman, 2023). This inference should not cause panic but address the importance of reconciling emerging methodologies with educational practice (Lim, Gunasekara, Pallant, Pallant & Pechenkina, 2023), which associates teacher training, preparation of university students, and other agents linked to research and higher education (Garcia-Peñalvo, 2023). This is because teaching skills with critical thinking in the face of the teaching-learning process mediated by innovative technological resources have an impact on quality education (Winarto, Cahyono, Sumarni, Sulhadi, Wahyuni & Sarwi, 2022; Araújo, Sousa, Ponce & Fialho, 2021).

The central problem of the research was: Can working with micro-narratives generated by ChatGPT constitute a didactic resource to mediate teaching and learning? To respond to this concern, scientific research of the action-research type was elaborated, to understand how ChatGPT can be used in teacher training as a didactic tool to mediate learning in the virtual space based on micro-narratives.

In this way, the study was developed with university students who were enrolled in a course with a central motto in teacher training, to better understand the use of micro-narratives and ChatGPT as didactic tools to interrelate these two innovative pedagogical resources included recently in the academic and professional debate, which has been gaining space in educational training. They have not yet been exhaustively explored and they emanate controversial ideas and little security from their users.

Faced with a changing reality in which technologies based on artificial intelligence reverberate in different areas of society, including education, thinking about the repercussions of ChatGPT based on the paradigm of micro-narratives is of academic, scientific, and social relevance when correlated with teacher training. Despite that micro-narratives as a pedagogical resource are consensual in the academic literature, ChatGPT is a current tool, little known, and still incorporating new features, but brings together a large number of users and causes debates among agents linked to education.

2. Methodology

A qualitative, action-research study was carried out with 27 university students regularly enrolled in the doctoral course of the Graduate Program in Education (PPGE- *Programa de Pós-Graduação em Educação*) at the State University of Ceará (UECE- *Universidade Estadual do Ceará*), in Brazil. The qualitative approach was chosen because it allows an understanding of the subjective aspects of social phenomena that are not subject to quantification, considering the particularities of a group or collective of people (Martins, 2004). On the other hand, action research was selected for the possibility of studying a current research object, as a relevant concern for the scientific community, while collaborating with the teacher training and researchers who will work directly in the community in the educational context, highlighting a critical knowledge for more qualified work.

The PPGE of UECE, the locus of the investigation, proved to be suitable for the development of the study because it is the only Post-graduation program (master's and doctoral level) in Brazil with teacher training as the only axis of research. In this way, the lines of study, subjects, dissertations, and theses closely dialogue with the professional teacher training. Furthermore, in addition to being a national reference, the aforementioned PPGE proved to be accessible for carrying out the research. Located in the northeast region of Brazil, it helps people holders of degrees, bachelor's, technological graduation, and master's degrees in courses recognized by the Ministry of Education (MEC) or revalidated in the country.

It is important to highlight that, before the beginning of the study, we complied with the ethical precautions required by the Research Ethics Council (CEP- *Conselho de Ética em Pesquisa*) of Brazil. Thus, the project was approved under number 4.740.147/2021, and all participants invited to collaborate agreed

by signing the informed consent form, which explained the possibility of withdrawing at any time, the form of participation, the objective, and the possible risks and benefits of the research. The study was endorsed by the UECE PPGE Coordination, which considered carrying out the study with the students of the Thesis Seminar subject due to the knowledge to be worked on in the action research has a close relationship with its syllabus. It should also be noted that the data obtained from the research with the guarantee of the anonymity of the informants are preserved in an open data repository (Data recorded in Zenodo, at: https://zenodo.org/deposit/7976126, it has provisionally closed access to preserve anonymity) and can be accessed whenever necessary.

In addition to understanding social phenomena, action research aims to intervene in the situation studied in order to change it. In this way, it allows for an interrelationship "between theory and the application of practice, and arises precisely from the need to bridge the gaps between teaching and research, and therefore between theory and practice" (Mosaner, 2008: page 83). In the case of this research, it makes it possible, based on a previous diagnosis, to design and develop a formative action that, in this case, brings understanding of microrelatos and ChatGPT closer to educational practice.

As Tripp (2005) teaches, the action research was carried out in five phases: diagnostic, with a mixed questionnaire to check prior knowledge about the production of micro-narratives in ChatGPT; action planning, with the elaboration of the training plan; taking action, with the practice of using Chat to generate micro-narratives and work with them in a didactic perspective in the virtual space; evaluation, based on the socialization of micro-narratives and their circular discussion; and learning, with a textual record of the educational possibilities and limitations of the micro-narratives.

The mixed questionnaire consisted of three blocks of questions. The first sought to outline the profile of the participants, enabling the choice of a fictitious name by the collaborator, and asking about age, gender, and experience in teaching. The second sought prior knowledge about ChatGPT. Therefore, they were objectively asked whether they had heard of this tool and whether they had already used it and, if so, a dissertation report on their knowledge was requested. The third sought to know prior knowledge about micro-narratives, and as a result, it objectively inquired whether they had already heard of micro-narratives or used them as a pedagogical resource, and, if so, they were asked to write an essay about their knowledge about micro-narratives and their didactic use.

The researchers prepared the action planning in collaboration with the students shortly after the return of the diagnostic questionnaires, which, in general, demonstrated the students' lack of knowledge about handling the ChatGPT and its use as a teaching tool. This plan was composed of 5 items: 1) Content - ChatGPT as didactic perspectives to work with micro-narratives in teaching and learning in the virtual space; 2) Objective - to understand how ChatGPT can be used in teacher training as a didactic tool to mediate learning in the virtual space with micro-narratives; 3) Methodology – with the description of the development of the action 4) Resources - multimedia projector, notebook and computers with internet access; 5) Assessment – interview about the training experience.

Taking the action had four more phases: oral explanation by the researchers of the characteristics and functionalities of the ChatGPT tools for working with micro-narratives (writing and reading screen, AI Image buttons, and AI Text ChatBot); practical use of the Chat by the students to generate micro-narratives in the virtual space; socialization of micro-narratives developed with ChatGPT; and circular discussion considering possible benefits and harms of the pedagogical use of these resources.

The evaluation was carried out by the students mediated by the researchers sharing the micro-narratives produced by the collaborators through ChatGPT. In this way, those who volunteered had the opportunity to read the micro-narrative produced aloud to their colleagues and share their experience with handling the Chat. The participants commented on the quality of the micro-narrative and the limitations and possibilities for using them as a pedagogical resource in educational work.

Learning, as the last phase of the action research, was carried out with the oral record, from individual interviews recorded and transcribed, about the educational possibilities and limitations of the micro-narratives generated by ChatGPT. In this final stage, the lessons learned from training were recorded and, critically, the feasibility of working with micro-narratives and ChatGPT to mediate teaching and learning, pointing out problems and ways to adjust the tools for the best use as a didactic resource.

The considerations reported in the interviews about the use of the ChatGPT in the formulation of the micro-narratives and the methodological strategies that could be implemented with the students of the participants were grouped to each of the enunciators using the alphanumeric code "**** *prof_n., gen.", from "**** *prof_01f" to "**** *prof_21m", in which the form "prof" indicated the profession of the participants (professor), the "n" informed the order of statements and "f" and "m" were for the gender they declared: "female" and "male". This way of coding, including the addition of the asterisk graphic sign, met the requirements demanded by the software used in the treatment of qualitative data, the *Interface de R pour les Analyzes Multidimensionnelles de Textes et de Questionnaires* (IRaMuTeQ), version 0.7 alpha 2 (Camargo & Justo, 2018), whose formulations were interpreted in correlation with the data set obtained in all phases of action research and based on current scientific literature.

3. Results

The results of the diagnostic questionnaire showed that among the 27 university students participating in the research, 6 were men and 21 were women. Even as students, most combined studies with professional activity. In this way: 6 had teaching experience in both higher education and basic education; 5 only in higher education; and 16 only in basic education, of which one had experience in kindergarten, 10 in basic education, and 5 in higher education. It is important to emphasize that the results did not change when correlated with the gender of the participants, their professional insertion and level of teaching activity, since the lack of knowledge about the ChatGPT was widespread and all participated in the action research under equal conditions.

Regarding what they already knew about ChatGPT and the importance of micro-narratives for educational work, they demonstrated little prior knowledge and practical inability. About ChatGPT, 17 university students said they had even heard of it and knew nothing about writing this artificial intelligence. Another 10 reported that they had already heard something about it, but only 4 of them managed to write about their knowledge, as the excerpts from the diagnostic questionnaire demonstrate, identified by fictitious names as mentioned in the methodology:

> *It is the use of artificial intelligence for the elaboration of texts, construction of images, etc.* (Chico).
>
> *What I was told is that it is a chat where you talk about a topic and an artificial intelligence responds about the topic* (Marx).
>
> *It is an artificial intelligence that responds to commands typed by the user in an online environment. Answers are obtained in written format* (Bob).
>
> *It is an application where you can ask it to generate a text the way you'd like: type of language, what specific subjects to address, and which parts to prioritize. As the text is being generated, you can also request changes and new insertions in the text, and they will be made* (Liz).

The diagnosis revealed that despite the rapid spread of ChatGPT use around the world (Cooper, 2023), this technology was still obscure to most university students who could infer nothing or almost nothing about the tool. Not much different, knowledge about the micro-narratives was even more incipient since 25 participants stated that they did not know the terminology, one had already heard about them but had not worked didactically with them, and only one managed to report something about their didactic use. Here are the only two open responses written in the diagnostic questionnaire:

> *I only heard that someone had used it, but I didn't get detailed information about its use, what it is, and how* (Joana).

I used it with my students after reading a short story. I asked them to write a short story text about what they had read (Bia).

Considering the little prior knowledge of the collaborators, it was necessary to think of an action plan, democratically elaborated with the participation of all, that would contemplate the explanation of the elementary concepts, situate the current discussion, and provide a workshop for its practical uses, demonstrating the possibilities of use of micro-narratives generated by ChatGPT as a didactic resource.

Regarding the micro-report as a teaching resource, like other literary texts, it can also become a means that allows literary content to be brought into the classroom in a playful way, making it possible to develop themes quickly and critically (Cogollo, 2012).

After acting, with an expository class, practical production of micro-narratives using ChatGPT, socialization, and circular discussion of the results returned by the chatbot about its didactic potential and limitations. A new evaluation was carried out through individual interviews, which assessed its pedagogy use for learning in the virtual space provided that it is explored with ethics and critical awareness.

More specifically, 21 of the 27 participants agreed to be interviewed and the respective transcribed verbalizations were integrated into the general corpus submitted to the IRaMuTeQ software. Automatically, the program divided the 21 texts into 91 text segments (TS), which are the word environments of the approximate size of three lines. Thus, 3,129 occurrences emerged, of which 710 were distinct words and 381 with a single frequency, called hapax.

With the retention of 69 TSs (75.82%), the 21 statements were categorized into the six classes illustrated in Figure 1, a dendrogram of descending hierarchical classification (DHC), containing the lexical forms in order of relative importance, from top to bottom.

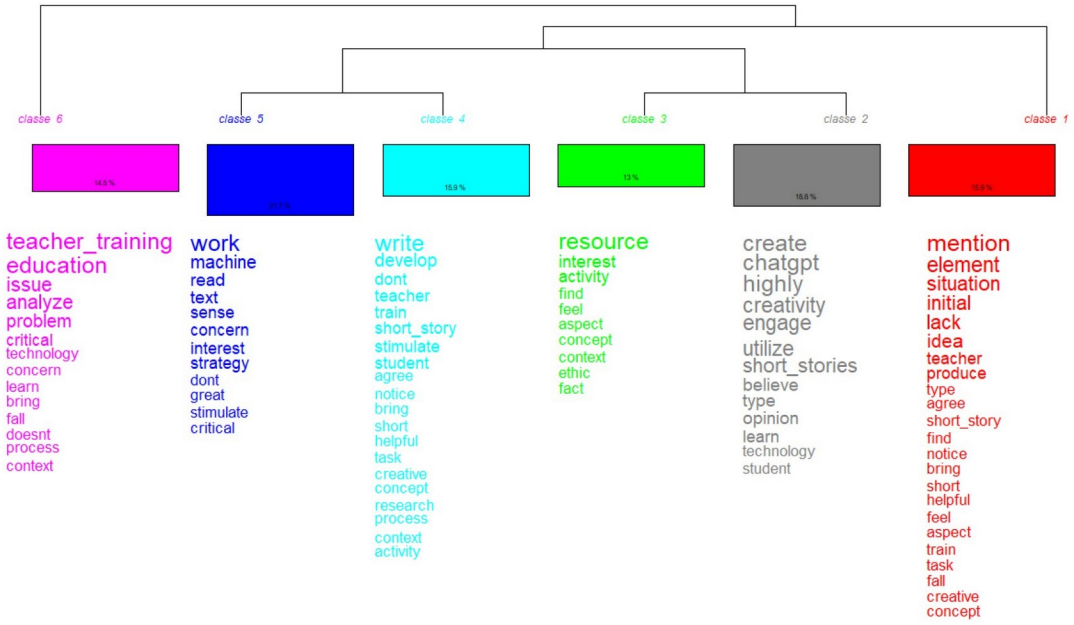

Figure 1. Dendrogram of DHC (Research data in the figure produced by IRaMuTeQ, 2023)

The corpus, when segmented into six classes differentiated by color, revealed class 6 (pink), at the top level, linked to the other classes, immediately being class 1 (red). Next, class 1 is connected to two congeneric level sub-bodies, one formed by classes 5 (dark blue) and 4 (light blue) and the other by classes 3 (green) and 2 (grey).

In class 1, 11 TSs (15.94%) were grouped and the most significant words, with $p < 0.0001$, "mention" (x2 28.42), "element" (x2 22.27), "situation" (x2 17.9), "initial" (x2 16.54) and "lack" (x2 16.54) were related to the testimony of "prof_19f" (x2 10.86), however "prof_08f" (x2 2.33) also contributed to its composition.

In agreement with the TSs representative of class 1, such as, "I acknowledge that the task was to create a short story, and coherence is an essential element, but I found it lacking in specificity. I expected ChatGPT to provide a more comprehensive response since it conducts a general search of what is available on the web" (Prof_19 f) and "it focused heavily on teacher practice, emphasizing the importance of the teacher, but it did not mention the essential elements of what is important to train an early childhood teacher" (Prof_08f), the thematic axis was inferred: "ChatGPT in the formulation of micro- narratives", in which professors took a position on the ability of ChatGPT to elaborate micro-narratives on multiple themes.

The connections of classes 2 and 3 identified by the DHC led to bringing both together in the same thematic axis: "Pedagogical activities mediated by ChatGPT", in which professors advance from the specificity of micro-narratives and issue opinions on the mediation of the teaching-learning process in a broader sense. As proof, in class 2, 13 TSs were cataloged (18.84%) and, in the first positions, the words "create" (x2 19.1), "ChatGPT" (x2 18.52), and "highly" (x2 18.29) were presented, as well as the statements of "prof_02f" (x2 5.97), "prof_07f" (x2 4.69) and "prof_13f" (x2 4.37. As typical TSs in agreement with the benefits arising from the inclusion of ChatGPT in the educational context, they said "Being highly optimistic about ChatGPT and this activity of creating short story I believe it can be utilized to compose short story based on historical events or scientific facts, which can be incredibly engaging for interdisciplinary work in the classroom" (Prof_13f) and "I thought ChatGPT was highly effective in creating meaningful texts" (Prof_02f).

In the same trail of different opinions, in class 3, 9 TSs (13.04%) were grouped and there was an emphasis on the term "resource" (x2 33.45) and on the verbalization of "prof_18f" (x2 6.67), however, the statements of "prof_06m", "prof_17f" and "prof_05f" integrated it with different perspectives. Among the corresponding TS are: "I also think it can be added to the activities we ask the students to do. However, our critical sense should be sharpened, and if the student indicates that it was done using the resource, then we will have to resort to another mechanism" (Prof_18f); "it would be the same if the student were to use Google Translator or any other resource. But I get upset because the student used ChatGPT" (Prof_06m) and "nonetheless, it should not be considered [the ChatGPT] an ultimate destination. Regarding the short story, I found the activity interesting (Prof_05f).

Analogously to the correlations between classes 2 and 3 at the same level, classes 4 and 5 shared a significant thematic affinity. Then, they referred to the thematic axis: "Possible reverberations arising from the use of ChatGPT by students", given that, in class 4, 11 TSs (15.94%) were specified and "write" (x2 31.49) and the speech of "prof_04f" (x2 5.69), despite the participation of "prof_11f", which are mirrored in the TS "I am a pedagogy professor, and students dislike reading. If they don't read, they consequently can't write. Using this ChatGPT proposal can be cool and stimulating, but it can also be problematic" (Prof_04f) and "I also agree that we need to reconsider how we assign tasks to students because if we ask them to write a text and accept it as the final product, there will be a lot of plagiarism (Prof_11f). In turn, in class 5, 15 TSs (21.74%) gathered, with emphasis on "work" (x2 33.34) and "machine" (x2 15.29) and the statement of "prof_15f" (x2 7.41), but "prof_03f" participated, with the following significant TS: "But the worst thing would be if you were unaware of what ChatGPT is and how it works, don´t you think? How would you know that the texts might not be their own? (Prof_15f) and "That ChatGPT is interesting to work with students on the power of synthesis. Sometimes we struggle to synthesize certain subjects, works, or texts, and it is helpful for that" (Prof_03f).

In class 6, 10 TSs (14.49%) were ordered, in which "teacher training" (x2 31.8), "education" (x2 31.8), "issue" (x2 18.67), and "analyze" (x2 18.5) were underlined, in addition to the dialogue of "prof_01f" (x2 22.53), expressed in the TS: "One of the main issues is to bring these technologies into the debate on

teacher training because our students are way ahead of us [...]" (Prof_01f) and "I also struggled to accept this style of writing due to what I perceive as a deficiency in teacher training" (Prof_09f). These findings enabled the constitution of the axis: "training teachers to handle tools based on artificial intelligence technologies."

The similarity analysis corroborates the DHC evidence. This maximum tree, figure 2, displays the associated words in colored rings and, through the thickness of the branches, refers to the strength of these relationships.

As shown in Figure 2, all branches start from the core term "student" (f=38) located in the blue halo, from which, to strengthen, they are directed to the circumferences in yellow "ChatGPT" (f=39), green "text" (f=30), pink "short story (f=26), salmon " teacher" (f=17) and lilac with the terms "sense" (f=6) and "critical" (f=6).

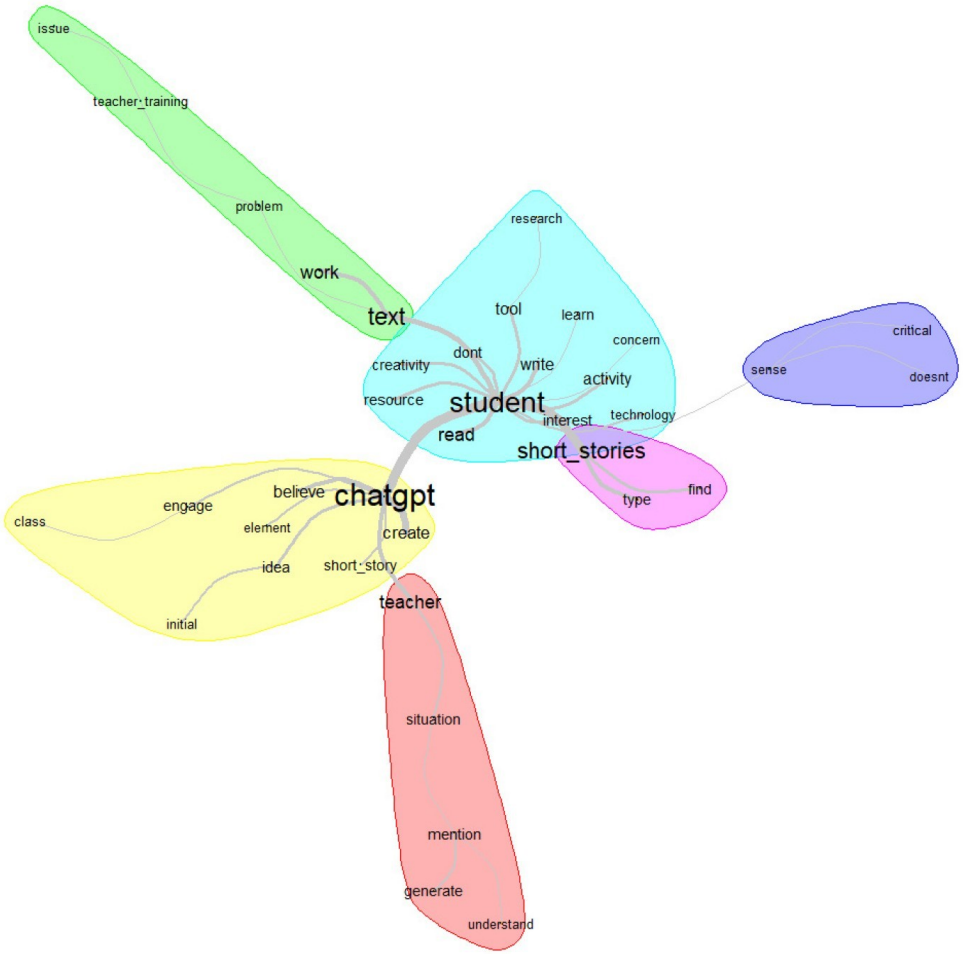

Figure 2. Similarity analysis graph (Research data on the formulation of the IRaMuTeQ, 2023)

4. Discussion

The use of 75.8% of the TSs validated the DHC, whose minimum retention recommendation is 75% (Camargo & Justo, 2018). The textual statistics, the chains and respective strengths in the tree of similitudes, and the STs arising from the transcription clippings of the verbal positions of the professors participating in the interview were complemented and consistent in the elucidation of the evidence summarized in four thematic axes presented considering the order of relative importance: 1) Teacher training to handle tools based on artificial intelligence technologies; 2) ChatGPT in the formulation of

micro- narratives; 3) Pedagogical activities mediated by ChatGPT; and 4) Possible reverberations arising from the use of ChatGPT by students.

According to the order expressed in the DHC connections, class 6 constituted the elementary axis 1) teacher training for the use of tools based on artificial intelligence technologies, in which the recognition of the training needs of professors for the proficient handling of pedagogical tools based on AI was evidenced. In this sense, prof_1f is blunt in asserting that some students are more experts in this belonging than the teachers themselves, in which the gaps come from the initial training and are not filled when already inserted in teaching. According to Lim et al. (2023), discussions about teaching, in times of massive technological use, require the understanding that verticalized educational models no longer respond to today's rapidly changing needs, as they require a transformative education, and therefore it is up to educational institutions and to policy-making bodies that contribute to this provision.

Kasneci, Seßler, Küchemann, Bannert, Dementieva, Fischer et al. (2023) mentioned that large language models, such as ChatGPT, represent significant advances in the field of AI and can favor the creation of educational content, personalize learning, and encourage student involvement. However, one of its challenges is precisely the acquisition of sufficient skills for professors and students to critically understand these models and extract the maximum ethical benefits from them. Fialho, Andrade de Sousa and Costa-Freire (2020) make an important question about the substantiality of educational institutions providing their professors with a specific time for the acquisition and development of teaching knowledge compatible with the new demands, especially in realities such as Brazil. They said that work precariousness, such as work overload, was asserted during and after the Covid-19 crisis (Neves, Fialho & Machado, 2021; Fialho & Neves, 2022; Neves, Machado & Fialho, 2022).

From class 1, axis 2) ChatGPT in the formulation of micro-narratives emerged, which, specifically, brings together the lessons of professors regarding the performance of ChatGPT in the composition of micro-narratives. Although it is a very particular application, in which the participant focus group freely decided on the subject related to teaching for ChatGPT to prepare the micro-narratives, benefits, and inconsistencies were found.

For Prof_08f, there was a lack of essential elements on how to train a teacher for early childhood education, despite emphasizing the importance of being a teacher. They also mentioned: the absence of critical and in-depth analysis of educational issues (Prof_01f; Prof_02f), generic (Prof_03f), extensive (Prof_08f), and disconnected elaborations and of the micro-narrative genre (Prof_12m). However, ChatGPT can be useful for returning historical and scientific micro-narratives (Prof_13f) and working on students' skills on literary topics (Prof_17f). These data suggest that ChatGPT, in version 3.5, does not yet have sufficient specificity for micro-narratives on educational topics; however, as the model used in this study was GPT 3.5, with free access upon prior registration, it is possible to obtain better performance with the most improved version. This is because OpenAI (2023) is committed to remedying the inconsistencies of the previous model and from March 2023, GPT 4 was available, more accurate and profound, for subscriber users.

With accuracy, several studies evaluate the functioning of ChatGPT 3.5 in different domains of education, and the results are compatible with those of this study, for detecting assertions and inaccuracies and dividing opinions. Hub (2023) compared the ability of ChatGPT with Korean students to respond to a Medicine test, the chatbot, with 60.8% of correct answers, fell short of academics, who answered 90.8% correctly. However, in the study by Gilson, Safranek, Huang, Socrates, Chi, Taylor et al. (2023), ChatGPT achieved similar results to third-year trainee physicians. When recruited for interpretive and application-specific questions, ChatGPT 3.5 has limitations (Fergus, Botha & Ostovar, 2023).

Closely associated, classes 2 and 3 recommended a single axis: 3) Pedagogical activities mediated by ChatGPT. They were the synthesizer of the evidence on the ChatGPT marks in the teaching-learning process in a broader sense, not just about micro-narratives, in which the reflections amalgamated three main perspectives: emerging technologies, teaching, and learning.

Andres-Suarez (2015) warns that the web and its technologies are represented in young people's texts, and that while the benefits they bring to the individual are recognized, there are risks and challenges to the development of AI for humanity. However, the greatest interest of the micro-report, produced through AI, lies in the authors' ability to transform scientific ideas into poetic and fictional material (Romero-Oliva, Heredia-Ponce & Romero-Claudio, 2023).

The potential of ChatGPT was believed to involve students in a multidisciplinary way with different contents (Prof_13f) and with the creation of interesting texts (Prof_02f). ChatGPT, in the face of more autonomous students, can fulfill the attributions of a virtual tutor and make interactive learning feasible (Gilson et al., 2023), answer them in a personalized way in real-time, and support research and writing of texts (Farrokhnia, Banihashem, Noroozi, & Wals, 2023; Khan, Jawaid, Khan & Sajjad, 2023).

However, some professors think: incorporating ChatGPT in activities will obscure student creativity (Prof_07f) and facilitate plagiarism (Prof_11f). In any case, the professor's critical sense needs to remain sharper (Prof_18f), to discern what is authored by the student or ChatGPT. Academic integrity issues permeate discussions as a whole and are problematized by scholars from various parts of the world, even suggesting the creation of tools capable of discerning whether personal production and ChatGPT and, if it is collaborative with ChatGPT, which there is transparency regarding co-authorship. To confirm, the case study by Tlili, Shehata, Adarkwah, Bozkurt, Hickey, Huang et al. (2023), researchers from China, Turkey, Australia, and the United States, suggested the possibility of plagiarism and transferring the desired dedication of students to the chatbot in carrying out school/academic tasks. In these circumstances, Perkins (2023), from Vietnam, understands that, given the evolution of major language models, such as ChatGPT, it is necessary to commit higher education institutions to guide students and professors on the conscious and enlightened use of the tools. Moreover, it is urgent to formulate policies and guidelines on these innovations in education. In the study by Shoufan (2023) with university students in the United Arab Emirates, the influences of ChatGPT on academic integrity divide opinions and suggest that professors learn to use ChatGPT to guide students.

Similar to the sharing of thematic associations, classes 4 and 5 generated axis 4) Possible reverberations arising from the use of ChatGPT by students, eloquent in considering the influences of ChatGPT in the face of certain limitations of students.

For students without the habit of reading, ChatGPT can encourage this practice (Prof_04f) and synthesize more extensive textual content (Prof_03f), but there is a risk that the tool will carry out school/university activities due to students (Prof_04f). When composing the list of optimistic researchers, Crawford, Martell, Sullivan and Ngok (2023) argue that AI is supportive, an alternative way of learning, and will not replace it. However, it challenges professors to reconcile the way of teaching, learning, and assessing in addition to fostering ethics among students.

In Prof_15f's questions, the most challenging situation would be the teachers' lack of aptitude with the chatbot and the inaccuracy in determining whether the texts generated are legitimately from the students. Indeed, Cooper (2023) argues that, for now, the many inquiries about the ChatGPT applied to education prohibit closed conclusions, therefore requiring follow-up and deepening about these repercussions. Given this, Day (2023) advises dosing the initial euphoria on the usefulness of ChatGPT to produce scientific literature. Alkassi and McFarlane (2023) point out that generative models trained with large numbers of data can present hallucinations, characterized by providing unreal answers as if they were real.

The correspondence between teacher training and the use of ChatGPT in formal education points to the essentiality of a critical human posture of understanding, evaluating, and, if necessary, correcting productions through different technological tools. Faced with the engendering of a kind of competition between humans and AI-based technologies, which leads the world to question whether professionals and people will become obsolete, these results point to the urgency of incorporating comprehensive knowledge of emerging technologies that are indispensable to praxis education, in a permanent attitude of action and reflection, reconciled with today's transformations.

5. Conclusions

Digital information and communication technologies can be used as allied resources in the mediation of knowledge, increasing didactic methodologies, especially those technologies that use artificial intelligence for their development. In the context of higher education, teaching without the use of technological resources is no longer conceived since this emergence can facilitate learning, including making it more attractive and interactive.

In this area, the program called ChatGPT appears, developed from the use of artificial intelligence, which gained worldwide prominence in 2023 for producing and returning text, among other products, simulating human responses. Among its functionalities, the chatbot enables the elaboration of micro-narratives, with the potential to be used pedagogically.

The objective of the research was precisely to understand how ChatGPT can be used in teacher training as a didactic tool to mediate learning in the virtual space based on micro-narratives. To answer it, action research was developed with Brazilian university students enrolled in Post-graduate courses of teacher training.

The diagnostic phase found, through a mixed questionnaire, that the university students' knowledge was incipient, both about ChatGPT and about micro-narratives as a pedagogical tool. From this, a theoretical-practical intervention was carried out that worked on the concepts of micro-reporting and the use of ChatGPT, enabling the sharing of productions and the circular discussion about the potential of this technology as a tool to mediate teaching and learning. After the intervention, an evaluation based on thematic interviews found the feasibility of using micro-reports generated by ChatGPT from a didactic perspective in the virtual space, discussed in four thematic axes: 1) Teacher training to handle tools based on artificial intelligence technologies; 2) ChatGPT in the formulation of micro-narratives; 3) Pedagogical activities mediated by ChatGPT; and 4) Possible reverberations arising from the use of ChatGPT by students.

Regarding the first axis, the lack of teacher training in the efficient use of pedagogical tools supported by artificial intelligence, such as ChatGPT, became evident. In addition, professors reported that their students have more knowledge about these technological resources than they do, reiterating the need for a public policy for the teacher's continuing education to foster qualified knowledge about innovative technologies.

Regarding axis 2, some inconsistencies were found in the micro-narratives generated by ChatGPT, mainly related to its basic characteristic, which is hyper-brevity, as well as the lack of critical analysis of what was requested in the micro-narratives to the tool, which allows inferring that the chatbot does not replace human work and that the in-depth analysis carried out with criticality can only be carried out by students and teachers, who need a qualification for this.

Even so, the third axis reveals that it is possible to combine ChatGPT with didactic activities since it can help with language skills and allows students to explore different textual genres, ask questions and receive informative answers that can encourage curiosity and creativity for research and other explorations, as well as soliciting the need for reflective and critical thinking. It is important to highlight that some participants reported concerns that the tool might lead to plagiarism. However, university students recognize that the professor should have better ownership of these innovations and will need to critically evaluate the information provided and verify it in reliable sources.

Finally, in the fourth axis, the participants claimed inaccuracy in the generated text and the apprehension that it could be validated without critical analysis. As ChatGPT 3.5 learns from datasets, it can inadvertently exhibit biased behavior. This aspect may be a limitation of Artificial Intelligence, as this version does not have the competence to manage feelings and empathy. The chatbot may not understand or respond appropriately to emotional cues or sensitive topics, hindering effective communication and support. Despite this, as OpenAI has already pointed out, version 4 contains more parameters and computational power, which allows it to deal with more complex tasks and language patterns, since the

GPT-4 training dataset is ten times larger than the 3.5, improving its performance and accuracy in generating responses.

A limitation of using pedagogical micro-narratives is their limited scope, as they may not cover all aspects or nuances of a topic. They may focus on specific elements or highlight certain perspectives while neglecting others, limiting the breadth of learning experiences. However, mediating knowledge based on micro-reports can be subjective and challenging, stimulating creativity. For its use, professors need to develop clear criteria to fairly assess the depth of understanding and engagement demonstrated in the textual genre by students.

The research is relevant for expanding knowledge about how ChatGPT can be used in teacher training as a didactic tool to mediate learning, as well as for allowing thinking about pedagogical strategies in the creation of micro-narratives with its use, knowing its flaws, and perceiving its benefits. In future action, we suggest replicating this investigation with teachers and professors in different areas of knowledge and with different levels of performance - basic and higher - using version 4 of the ChatGPT to continue the reflection on how this technology can be effectively applied in the educational process.

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