

Health education: potential for discussions in initial teacher training

ABSTRACT

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This article presents a discussion of Health Education (HE), an emerging topic in society that remains insufficiently explored in teacher education contexts. The study aims to analyze the understandings regarding debates and reflections on HE among pre-service Biological Sciences teachers. This is a qualitative study in Education grounded in the historical-cultural approach, using Microgenetic Analysis as its methodological framework. Eighteen undergraduate students in Biological Sciences teaching education from a Higher Education Institution participated in the study. The text was structured based on the metaphor of winds. As a result, three scenes were developed for analysis, from which two episodes emerged. We highlight the teacher's role as a mediator in the learning process, as well as the importance of implementing different pedagogical approaches in the classroom to promote the development and understanding of health from a comprehensive perspective of the individual. We emphasize that mediation fosters understanding of the social determinants influencing individual and collective health, and that this is a necessary approach and discussion within initial teacher education.

KEYWORDS: Cinema; Health Education; Science Teaching; Historical-Cultural Approach.

Educação em saúde: potencialidades de discussões na formação inicial de professores

RESUMO

Esse artigo apresenta uma discussão acerca da Educação em Saúde (ES), um tema emergente na sociedade, ainda pouco explorado nos meios formativos. O estudo tem como objetivo analisar as compreensões sobre os debates e reflexões sobre ES de professores de Ciências Biológicas em formação inicial. A pesquisa é qualitativa em Educação, tomando como base teórica a abordagem histórico-cultural, tendo como limiar metodológico a Análise Microgenética. Participaram do estudo dezoito licenciados/as de Ciências Biológicas de uma Instituição de Ensino Superior. O texto foi estruturado com base na metáfora dos ventos. Como resultados, foram construídas três cenas para análise, das quais emergiram dois episódios. Destacamos o papel do professor como intermediador do processo de aprendizado, bem como que a realização de diferentes encaminhamentos em sala de aula promove o desenvolvimento e a compreensão da saúde, que considera o sujeito em sua integralidade. Evidenciamos que a mediação favorece a compreensão dos determinantes sociais que influenciam a saúde individual e coletiva e que essa é uma abordagem e discussão necessárias na formação inicial.

PALAVRAS-CHAVE: Cinema; Educação em Saúde; Ensino de Ciências; Histórico-Cultural.

INTRODUCTION

In this text¹ we will use the metaphor of "winds²" to explain the formative process experienced by a group of Biological Sciences students, as well as the movements provoked by the gusts of wind during discussions regarding Health Education (HE) and the scientific denialism that these discussions reveal. We understand that these gusts in training sometimes strike hard stones that take years to be polished and/or redirect the winds in the interactive movement of the classroom.

The wind of knowledge in the Sciences is present throughout society, but this does not guarantee that it is known/recognized by all. Education is the essential foundation for the formation of citizens, with the skills to use knowledge being one of its main instruments, aiming to create conditions for reflection and creation, thereby allowing the dissemination of scientific-technological knowledge that occurs in schools to propagate in informal spaces, due to the "expansion of communication and information possibilities, through devices such as telephones, televisions, and computers," a fact that "alters our way of living and learning in the present day" (Kenski, 2003, p.1).

Such a situation demands students with critical thinking and knowledge of Science and other areas of knowledge, considering the rapid and extensive dissemination of information present in the media and social networks. It is important for students to discern opinion, fact, and information, as there has been an "unprecedented opportunity for the dissemination of false information about science on a global scale" (Pereira; Dos Santos, 2020, p.22), many of which have incited movements such as anti-vaccination and science denialism.

The concern to form more critical citizens is evidenced in research on teaching practices, as presented by Franco (2020). The author argues that pedagogical practice must be capable of enhancing the capacity for learning, engaging the individual with the subject matter, stimulating cognition, and the development of scientific school thought. This discussion is directly linked to debates about the initial training of Biological Sciences teachers.

The initial training of Biological Sciences teachers needs to focus on a critical perspective, capable of promoting a vision oriented towards social transformation, so that the teacher acts in mediating scientific school knowledge with the sociocultural context of the student.

In this context, Health Education (HE) in the school environment seeks to broaden understanding of holistic health, primarily by demystifying collective health issues, such as fake news about vaccines, and fostering scientific literacy. Health education is presented in curricula in a transversal and interdisciplinary manner, being related not only to specific disease issues but also to social matters, discussions of public policies, and facts that directly affect individuals' lives in society. Santos (2018, p.103) observes that "the National Curriculum Guidelines/1998 (DCN) point to health as one of the components of the Common National Curriculum Base (BNCC); thus, health is no longer seen as a program but as a mandatory curricular component." In this manner, the necessity for health education that encompasses the promotion of health in educational

environments, the prevention of diseases in sociocultural contexts, and the understanding of the topic interconnected with emotional, social, political, and environmental issues emerges.

According to Venturi and Mohr (2021, p.2), "Health Education (HE) is a field with multiple perceptions and understandings regarding its objectives, the teaching and learning processes involved, and the very concept of health: there are different understandings." Health education in the context of teaching is not always a planned or mastered topic by teachers, nor does it always possess pedagogical objectives or aim for alignment with the school context. The teaching of health education should enable students to be critical and ethical regarding discussions involving the topic, making conscious choices that promote individual and collective well-being and health, especially in the current moment of scientific denialism, where knowledge and scientific literacy are essential against movements of post-truth.

Thus, health education in formative processes, conceived as a source of dissemination of scientific knowledge, assumes a prominent position, as it unites the structure of formative programs with the promotion of health. In this context, a current concern is the dissemination of false news, which "has resulted in various problems, primarily related to trust in science, which leads to serious issues, especially in the health sector" (Martins; Venturi, p. 2023). Thus, scientific literacy in health has been considered an important way to contain media misinformation, as it enables interventions in the social reality in which the school is embedded, ensuring the formation of scientifically literate individuals.

We understand that the importance of health education in teaching environments is not limited to building attitudes and values aimed at benefits for one's own health and that of others, but also seeks to sharpen critical thinking to analyze and evaluate information sources, as well as to understand and select scientific knowledge.

Based on this understanding, the teacher plays an important role in the cognitive and intellectual development of students. According to the historical-cultural approach, we consider the teacher to be an intermediary in the process of intellectual development and learning of the student, with the aid of signs and instruments that lead them to think, question, and interact with their environment, in search of elaborated contextual knowledge, derived from social exchanges (Vygotsky, 2008).

The process of mediation by the teacher should contribute to the development of critical thinking construction. For Cossetin and Frison (2021, p. 228), the mediating teacher is the professional responsible in the school space "[...] for introducing concepts and establishing meanings that permeate the discourses manifested in the classroom, in order to promote the appropriation of scientific knowledge." To this end, it is important that in their pedagogical practice, they contemplate diverse teaching situations, organized "intentionally to meet specific educational expectations requested by a given social community" (Franco, 2020, p. 371), seeking the development of teaching, learning, and the expansion of students' knowledge.

As the school is a plural space attended by students with different realities and socioeconomic conditions, the inclusion of pedagogical practices that encompass these individuals and their realities is essential to achieve learning that promotes internalization, based on the significance and appropriation of knowledge regarding health education. According to Smolka (2000, p. 27-28), the "process of human development and learning as the incorporation of culture, as mastery of cultural modes of acting, thinking, and relating to others and oneself," directly influences the development of Higher Psychological Functions (HPF), as psychological functions are structured in the collective (interpsychic), in relationships with others, in the social sphere, and subsequently become psychological functions of personality (intrapsychic). Thus, "meaning is constructed in the interaction between individuals in combination with shared situations in the context and social relationships" (Santos, 2018, p.63).

The learning process is no longer related to conceptual alteration, but to the construction of new meanings that allow students to "construct meanings for the formation of scientific knowledge" (Santos, 2018, p. 63). Thus, we understand it is important to have an education attentive to the demands of society, especially those related to health, and that forms a critical, attentive, and research-oriented professional regarding their own practice. In the understanding of Sousa, Indjai, and Martins (2020, p. 9):

Education requires a critical stance and is not limited to the act of teaching, allowing future teachers to understand the combinations that are hidden and revealed in the educational landscape and the characters that compose the school space.

In this regard, from a Vygotskian perspective, we understand that the initial training process for teachers is "consistent with professional training for establishing transformative relationships with the world, beyond, and not strictly limited to, technical and immediate training in the application of definitions and problem resolutions" (Cossetin, Frison, 2021, p. 243). In this formative process aimed at developing a professional who understands the importance of a contextualized and meaningful educational action, it is necessary to reflect on pedagogical practices, as they are configured, as Franco (2020, p. 601) states, "in mediation with the other, or with others, and it is this other that offers practices their space of possibilities." For the author,

[...] pedagogical practices face, in their construction, an essential dilemma: their representativeness and value derive from social pacts, negotiations, and deliberations with a collective. In other words, pedagogical practices are organized and developed through adherence, negotiation, or even imposition. (Franco, 2020, p. 371)

Both teacher trainers and teachers in initial training need to understand the social context of students so that the methodologies applied in the classroom contribute to students' learning, enhancing interactions that provoke necessary changes. Thus, the exercise of teaching is constituted through the knowledge of training aligned with other knowledge, as expressed by Pauletti and Santos (2021, p. 1), "teachers are subjects who possess knowledge that is plural and complex, which is constituted from the knowledge of initial training, pedagogical practice, and the relationships established with their peers and with society."

In the organization of pedagogical practices, we highlight that the role of the teacher goes far beyond mediating: it involves building relationships between students and the culturally historically constructed context. At this point, the complexity of teaching work is evident, whose training must prepare teachers to recognize and act in a diversified manner, involving psychological, social, and biological aspects.

It is essential to be aware that the problems of education and teachers will not be resolved solely within the confines of schools. A political effort is necessary, a greater presence of teachers in public debate, and a clear awareness of the importance of education for the societies of the 21st century. The complexity of current societies, the existence of an unprecedented volume of information, or the centrality of knowledge and its social and economic valuation place teachers before tasks they cannot respond to alone. (Nóvoa, 2012, p.21)

In light of the social contexts in which schools are situated, it is important that the health content addressed in Science Education contributes to the construction and significance of school scientific knowledge, enriching the social and cultural emancipation of students, so that the grasp of this knowledge enables a more comprehensive understanding of reality, committed to rationality and critical thinking (Schroeder, 2008).

We understand from Vygotsky (2008) that the role of the school is to assist students in developing a critical view of society. To this end, the mediation in understanding concepts and structuring knowledge becomes important, as conceptual thinking allows for a more critical positioning, qualifying cognitive development and promoting the development of higher psychological functions (HPF). Thus,

[...] the promotion of quality scientific literacy is primarily the responsibility of these professionals. [...] one cannot dissociate the perspective of social valuation and scientific knowledge from the perspective of the basic and ongoing training of teachers. (Martins, 2005, p. 63)

Grounded in the historical-cultural approach, we can highlight the various possibilities for discussing health-related themes with the teacher's mediation in the appropriation of cognitive understanding. We can say that this process occurs in interactions between teacher-student and between student-student, in which the formative process serves as the main instrument for promoting quality teaching. According to Vygotsky (2008, p. 139), "[...] organized learning becomes mental development and activates a series of evolutionary processes that could never occur outside of learning." In this way, the intentionality of teaching in organizing activities, through the planning of actions, aims to enhance the development of students' critical positioning.

Based on this understanding, we comprehend that Science Education is extremely linked to the need for Science to gain public space, so that society is capable of understanding social debates. As expressed by Martins (2005, p. 61), "in our view, the mastery of scientific knowledge and knowledge about science is important for the common citizen to position themselves autonomously and critically regarding current issues." Scientific knowledge allows society to understand and resolve emerging issues, with critical positioning and the ability

to differentiate truth from lies. Thus, our objective in this text is to analyze the understandings regarding the debates and reflections on Health Education among Biological Sciences teachers in initial training.

METHODOLOGICAL PATH

This study adopts a qualitative approach in Education (Lüdke; André, 2013), characterized by the non-use of measurement or quantification methods for the data, as well as the absence of statistical instruments in the analysis. The research is grounded in Vygotsky's historical-cultural approach, with the methodological threshold being Microgenetic Analysis (Góes, 2000), which seeks to verify, through microevents, the issues related to subjectivation, through interactive dynamics or in the realm of interactions with others, in socially mediated processes (Silva, 2013).

Eighteen (18) teachers in initial training participated in the study, who agreed to be part of this research. Of these, six (6) are male, and twelve (12) are female, with an age range of 19 to 32 years. Regarding their origin, twelve (12) are from cities in the state of Rio Grande do Sul, two (2) from the state of São Paulo, two (2) from the state of Piauí, one (1) from the state of Rio de Janeiro, and one (1) from the African continent.

The empirical sources of the research were audio recordings and the production of questionnaires, obtained during meetings held during the teaching internship in higher education. The subjects of the research were the graduates of the curricular component (CCR) of Teaching Practice: Epistemology and Science Teaching, from the Biological Sciences course at the Universidade Federal Fronteira Sul (UFFS). The class was observed and investigated during the period of the teaching internship of the Master's Program in Science Teaching at the Higher Education Institution – IES. In total, eight synchronous meetings were held, each lasting three class hours, organized and planned by the training teachers (Table 1), identified here as PF1 and PF2. In this article, the first meeting will be used as a data source. The meetings took place from August to October 2021, with recordings made via the digital platform Cisco Webex, the virtual environment in which the classes occurred, due to the COVID-19 pandemic.

Table 1

Planning of the intervention developed in the eight meetings.

Meetings	Pedagogical Practices and Instruments
1°	Application of the health questionnaire – Google Form (<i>Google Forms</i>) Mentimeter Application - Word Cloud Excerpt from the film "The Constant Gardener" Dialogues and writing in the Training Diary
2°	Lecture: The Importance of the History of Science in Education. Dialogues and writings in the Training Diary

Meetings	Pedagogical Practices and Instruments
3°	Text and discussion on the Epistemological Approach of the History of Science (HC) in Education. Writings in the Training Diary
4°	Expository and dialogical class on the possibilities of pedagogical work of HC in the teaching of sciences and biology. Video on: Scientific Literacy in Education. Writing in the Training Diary
5°	Film Tropical Dreams - asynchronous class with questionnaires and script Training Diary (asynchronous class)
6°	Discussion forum addressing issues of scientific knowledge production in public health, based on the film Tropical Dreams. Writing in the Training Diary.
7°	Expository and dialogical class on the work of Oswaldo Cruz, the vaccine revolt, and the denialism of Science. Charges and videos regarding the denialist movements of Science, written in the Training Diary.
8°	Socialization of teaching materials produced by the teacher trainees, focusing on the use of cinema and discussions of the themes of HE and Scientific Literacy in the classroom.

Source: Authors (2026)

This research followed the assumptions of Carvalho (2015) in the organization of the data, adopting the definition of scenes and episodes, defined as "cuts made in the class, moments in which a situation that one wishes to investigate is evident" (Carvalho, 2015). For the discussion of the scenes, we employed the epigraph that opens the text, defined by the metaphor "The blowing of the winds," inspired by Érico Veríssimo's trilogy "Time and the Wind." This metaphor refers to the paths that the winds can traverse, to their force over the fields and valleys, laden with feelings and news. "The blowing of the winds" was subdivided into three scenes, named "The blowing of the winds, gaining strength," "Sea breeze and the movement of the waves," and "The breaking of the waves." Such a metaphor was utilized with the aim of demonstrating and highlighting the movements in the formative process, in light of the pedagogical intentionality of the teacher trainers.

For the structuring of the first scene, named "The blowing of the winds, gaining strength," we utilized questionnaires, made available on *Google Forms*, which were structured with the question "What does having health mean to you?" This questionnaire aimed to identify the initial understandings of health among the teacher trainees. The questionnaire was made available by the researcher, teachers PF1 and PF2, in class, via *Google Forms*, with a few minutes for responses.

For the structuring of scenes 2 and 3, named "Sea breeze and the movement of the waves" and "The breaking of the waves," we utilized the recordings from the virtual meeting held with the class. In order for this to be part of the research data, we employed the transcription method proposed by Carvalho (2015). The author argues that a recording is a rather complex phenomenon, as a single class can encompass a wide range of study material; after the transcriptions, episodes are cut out and analyzed.

Upon completing this phase, scenes 2 and 3 were constructed with the defined episodes and turns to identify the understandings of health present in the discourses of the teacher trainees. According to Carvalho (2015), the turns are the segments of sequential speech from the participants, presented within the episode, serving as a basis for discussion. Thus, the transcription stage followed the norms proposed by Carvalho (2015), adopting the following conventions: hypotheses about what was heard, indicated by "()"; insertion of comments from the researcher, by "(()"; prolongation of vowels or consonants, by "::"; truncation of words, by "/"; syllabification, by "-"; use of capital letters to indicate emphatic intonation; overlapping turns, by "_____"; and simultaneous speech, by "[]". Furthermore, the simultaneity of different languages, such as oral and gestural, was represented through changes in font formatting, using bold, italics, or underlining.

Thus, the planning and intervention with the teacher trainees of Biological Sciences were grounded in the historical-cultural perspective, highlighting the importance of joint action between the researcher and the class teacher, aiming at the construction of a shared and intentional pedagogical practice. Through the use of microgenetic analysis, we seek to identify the nuances of the process, as well as the understandings and the evolution of students' comprehension of health. By segmenting the scenes into episodes (Carvalho, 2015), we aim to highlight the importance of the mediating teacher advocated by Vygotsky, in the development of learning constructed collectively with the initial training of teachers.

The research received recognition and approval from the Ethics Committee (CEP) of the IES, opinion no. 51641721.8.0000.5564. As a means of preserving identity, the names were coded. The undergraduate students were identified as "L1, L2..." L = Licensure-track student, and the numbering corresponds to the number of participants. The professors responsible for the curricular course component were identified as "PF1 and PF2."

DISCUSSIONS

In this meeting, where the theme of health was presented and discussed, the training teachers mediated the class based on the questions from the questionnaire and excerpts from the film *"The Constant Gardener."*

After completing the transcriptions and analyzing the results, we found that one of the central discussion axes emerged, which is the initial perception and understanding of the theme of health by the students. The results emerged from the responses to the initial questionnaire (QI) and the transcription of the first meeting, where the theme of health was presented and discussed. In this

meeting, the training teachers mediated the class based on the questions from the questionnaire, excerpts from the film "The Constant Gardener"³, the word cloud, and questions and discussions. Thus, three scenes were constructed, divided into two episodes, which emerged from the analysis of the material from the first meeting. To present the episode and its turns, we will use the epigraph that opens the text, based on the metaphor of the winds that blow, which, just like in terrestrial dynamics, are important as they move through regions, causing changes in landscapes; in the case of our study, they refer to new understandings of health.

Scene 1 - The blowing of the wind, gaining strength

To construct scene 1, which presents the initial understandings of the students regarding the theme of health, the responses from the questionnaire (QI) were utilized. After the students responded to the questions, the discussion of the theme began in a remote class, in which the interaction between the students and teachers FP1 and FP2 was intense.

The intentionality of applying the questionnaire, much like a weather vane, is to indicate the direction of the winds. The QI aimed to identify the initial understandings, so as not to teach students what they already know, for "teaching a student what he already knows how to do alone is as unproductive as trying to teach something far beyond his zone of possibilities" (Ramos, 2018, p.45). Thus, the starting point for the mediating teacher becomes the predefined pedagogical intention, guided by the points of doubt presented in the investigative proposal. Next, the analyses of the responses regarding the understandings of health presented by the respondents are provided.

L1 (QI 1): physical and psychological well-being

L3 (QI2): To have a healthier diet and practice exercises

*L8 (QI3) **Self-care is essential**, even the most basic, such as staying hydrated, having a proper diet, engaging in physical activities, **entertaining the mind**, etc.*

*L9 (QI4): A good routine, following the recommended sleep schedule, drinking water, paying attention to diets, and above all, **maintaining psychological health, which is quite challenging considering the pressure exerted by a school/university***

*L10 (QI5): Good immunity, and when it is insufficient, some medical treatment or vaccine, ensuring well-being, knowing how to eat, exercising the body, maintaining a good mental state, **a set of actions for promoting health, both mental, physical, and social, as health is not merely the absence of disease***

L11 (QI6): A good diet, physical exercises, and plenty of conversation, as our mental health also matters.

*L13 (QI7): **We need the SUS to assist people; we require state investments in science** to continue conducting research that helps produce vaccines against diseases. In addition to **raising public awareness about the importance of having healthy habits**, there is also the care for nature, as without it, there is no healthy life.*

L14 (QI8): *A complete and regulated diet, **basic sanitation, financial and emotional stability**, maintaining proper sleep, these basic needs are not always met.*

L15 (QI9): *We first need personal effort, as without it, it is not possible to take care of our health or maintain it. Furthermore, I would say that it requires **financial resources and knowledge; some of these services can be found in the public health system.***

L16 (QI10): *Engaging in physical exercises, eating correctly, getting sunlight, **doing things we enjoy, sleeping well...***

L18 (QI11): *Firstly, having genetic factors that enable health concerning hereditary diseases **and reducing poverty and misery**, also, in case there is a possibility of diseases, that access to health posts is easy and free for all individuals, which ultimately refers to the quality of investments in the health of countries, where there may be numerous cases where it is not invested in or is not free.*

From this scene, we can perceive that, in the writing of the graduates, the view of the health theme, for the majority, is linked to the biopsychosocial model, which "provides an integrated view of being and becoming ill that encompasses physical, psychological, and social dimensions" (De Marco, 2004, p. 64). It is possible to note that the concept of health, for each individual, reflects their social, economic, political, and cultural context, thus allowing for different understandings depending on the place and social class in which the graduate is situated.

The biopsychosocial model defined by the World Health Organization (WHO) in 1948 integrates health "as a state of physical, mental, and social well-being, not merely the absence of disease or infirmity" (OMS, 1986, p. 11). We can observe that this model has a broader scope. In this sense, Scliar (2007) relates that in the health-disease process, there are numerous associated factors such as political, socioeconomic, cultural, and environmental factors, etc.

human biology, which encompasses genetic inheritance and the biological processes inherent to life, including aging factors; the environment, which includes soil, water, air, housing, and the workplace; lifestyle, from which decisions affecting health arise: to smoke or not to smoke, to drink or not to drink, to exercise or not to exercise; the organization of health care. Medical assistance, outpatient and hospital services, and medications are the first things many people think of when health is mentioned. However, this is merely one component of the health field, and not necessarily the most important; sometimes, having access to clean water and healthy food is more beneficial for health than having medications available. (Scliar, 2007, p.37)

The analyzed scene refers to the initial perception of what health is, which enabled the teacher trainers to identify the initial understandings of the students, as observed in the writings of L9, L10, L13, L14, L15, and L18. In these writings, various aspects related to mental and physical health, public policy issues, such as access to the Unified Health System (SUS), basic sanitation, care for nature, as well as social issues, such as access to work, income, and leisure, are mentioned. According to Figueiredo *et al.* (2010, p.118),

Health education should be understood as a proposal aimed at developing in individuals and groups the capacity to critically analyze their reality, as well as to decide on joint actions to solve problems and modify situations, in order to organize and carry out the action and evaluate it with a critical spirit.

We emphasize that discussions on the theme of health education in formative environments have persuasive capacity, as they can contribute to the development of knowledge and the construction of critical awareness. It is also noteworthy that "health education activities in schools can be planned and developed in the school curriculum by various actors: teachers from diverse backgrounds, school professionals, and health professionals." (Venturi; Mohr, 2013, p.2)

In this perspective, the teacher acts as the mediator in health education discussions, facilitating the mediation between the development of scientific knowledge and the construction of critical subjects in relation to the social context in which they are inserted. Just as the weather vane indicates the direction in which the winds blow, researchers PF1 and PF2 used the questionnaire to guide the beginning of the classroom debate, as they, supported by the historical-cultural approach, understand that the process of group discussion and interaction with others presents a greater potential in the construction of health education knowledge.

Scene 2 - Sea breeze and the movement of the waves

The initial questionnaire guided the group discussion, and upon observing the responses, we considered that revisiting the questions collectively expanded understanding, as well as the language and discourse presented by the students. Thus, we understand that the dialogical process is important for the grasping of knowledge. In this same vein, Santos (2018, p. 85) states that "working in the classroom, isolated, without establishing partnerships or dialogues with peers, one will not be able to think, reflect, and advance in their pedagogical work." Thus, action in a collective setting provides a greater reflective moment, in which the group seeks a path through the sharing of dialogues. Based on this thought, teachers PF1 and PF2 showed clips from the film "The Constant Gardener," lasting 15 minutes, and upon concluding the screening of the scenes, they posed the following question to the students: 'For you, what is health?', which was answered in the application *Mentimeter*. The responses formed a word cloud, from which a map was constructed, presenting some words/terms that represented the understanding of the meaning of the health theme by the students, which served as a basis for the beginning of the discussion of the proposed theme in episodes 1 and 2.

Episode 1. The breath and the formation of the wave

Turn 1. PF1: *So... did everyone respond then?... almost everyone... I would also like to hear their thoughts regarding this mosaic we constructed here when asked about the issue of health... what do you understand by health?... I noticed that the word that stood out the most was... Well-Being... Well-Being... life... well, what would well-being mean to you?... those who responded with well-being*

would like to speak... what would you understand as well-being?... let me see if there is anything here_____

Turn 2. L5: I believe it would be comfort... security, feeling good.... [uh-huh] can you hear me?...

Turn 3. PF1: Yes, we can hear you well... Here, L5 mentioned well-being... satisfaction... and what else?... Physical and mental balance, being well psychologically... and then... um:: later it appeared... **because health is a right for all?**... who mentioned that?

Turn 4. L5: It was me too... (laughs) I mentioned it because health is one of the main... **rights, right?**... of humanity and **we must always fight for this, especially... to ensure that the SUS continues to function, right?**... in Brazil, that is why I stated it is a right for all...

Turn 5. PF1: uh-huh... I saw here in the chat that both L18 and L16... stated that **"feeling good helps with mental health,"** why?... Why does it help with mental health if we feel good?... Or give me examples... L18, right? ___ oh, excuse me...

Turn 6. L18: I would say... **that feeling good helps to avoid some problems... like depression....** now I do not remember the name of that problem where a person self-harms, so feeling good helps a lot... to avoid many problems...

Turn 7. L13: Prof_____

Turn 8. L13: I am not certain if it would be well... **but social welfare would not be the state's concern?... in promoting the:: safety of the population... Taking care, for example, of waste... of vaccines... at the health posts, would that be it?** I am not very sure...

Turn 9. PF1: It could also be, right?... and what else do you all think encompasses this?... And E8, who did not join when we were doing the Menti... what does health mean to you, E8?...

Turn 10. L8: Prof, one moment... Let me just finish my response here...

Turn 11. PF1: minutes::... so you all brought several... expressions, right?... everyone speaking about well-being... care... quality of life... **what would it mean to have quality of life to have health?**... what is necessary from what you listed to have quality of life?...

Turn 12. L10: **Then the issue of social welfare comes into play, right?**...

Turn 13. PF1: uh::_____

Turn 14. L10: quality of life in a general aspect... **not having life inequality, these things often generate situations that::... lead people to need health, right?..** and we know that normally these people do not have access to health, they are the ones who need it the most in this case...

With this episode, we perceive the breath of the wind and the movement of wave formation, which begins in the speech of L5 - Turn 2, which demonstrates confidence in presenting its view on the subject. We observe that the ideas/understandings shared verbally demonstrate a significant stance regarding the theme, as when L5 opens the discussion and, when questioned, positions

herself again and reaffirms her previous comment (L5 - Turn 4). In the same discourse, it is possible to notice a stance of a social and political nature, since, even with several initial pauses in her speech, it is evident that L5 has a firm position regarding social demand aspects and the defense of rights, which are made possible by political actions. Such a conclusion is supported by Lucchese's speech (2004, p.6), who also states that "public policies materialize through the concrete action of social subjects and institutional activities that realize them in each context and condition their results."

When analyzing L10's speech - Turn 12, we observe that there are quite a few vocal pauses, and this interference suggests doubt. However, in L13 - Turn 8, we also notice these vocal pauses; however, her speech reveals greater conviction; even with doubt in her response, the pauses presented by L13 may be associated with the linguistic variation of her place of origin, while in L8's speech - Turn 10, we note that the licentiate is researching or thinking about the best way to structure a response.

We observe, in a very intertwined manner in the dialogue of the teacher trainees, the presence of the biopsychosocial model, based on Scliar's work (2007), whose concept of health has a trajectory with relevant changes in the perception of the health theme. This broader view is notable in the debate on the interrelation between the health and disease process of human beings, along with environmental modifications, political-economic movements, sanitary conditions, and the lack of investments in social policies.

In the dialogue between PF1 and the licentiates, the formative winds drive the formation of new waves, as, when presenting the same model in both turns, the difference in discussions between them is observed. The fact is linked to PF1's intervention, which plays a fundamental role in directing the dialogue and constructing knowledge. "An interaction that enables the construction of scientific knowledge must have as its structuring axis the problematization of that knowledge" (Guimarães; Mattos, 2010, p.43). The debates on HE in the field of teaching are directed towards the questions and reflections that involve the initial training processes of teachers, in which the teacher's interaction in the processes of signification of concepts and construction of knowledge directly interferes with the social vision of the subject (Vigotski, 2008). Health Education, in the formative field, has been consolidating, gaining space and visibility in research and practices, as the authors defend (Santos, 2018; Venturi, 2018; Silva, 2013).

In turns 4 and 14, the licentiates L13 and L10 advocate social and political issues, in accordance with Schroeder (2008), who already argued that health is a right that is earned. Depending on the awareness of its value, this understanding should imply voluntary action; thus, HE in school means the formation of attitudes and values that lead the student to intelligent behavior, benefiting both their health and that of others.

From the excerpts of the film "The Constant Gardener," the word cloud, and the intentional questions from PF1, new waves are forming, as another point is addressed by the licentiates: quality of life. For L10, quality of life encompasses both physical and psychological issues, as well as the interference of public policies. Minayo *et al.* (2000, p. 8) express that quality of life "encompasses many

meanings, reflecting the knowledge, experiences, and values of individuals and collectives that refer to it in various times [...], thus being a social construction marked by cultural relativity." In this sense, teaching environments are conducive to the development of daily actions that solidify and interfere with the social environment in which the student is inserted.

Scene 3 - The Breaking of the Waves

The teacher, as an intermediary during the conduct of the class and discussions, is the bridge between the student and knowledge, so that there is an understanding of the scientific knowledge being worked on in the classroom, in such a way that the student is capable of questioning the situations that involve their daily life. According to Vygotsky (2008), the human being is in constant construction and transformation through the social interactions it establishes, a fact that confers new meanings and perspectives on life in society and on group agreements. In this research, the mediating teacher plays the role of mediating this interaction and understanding of knowledge, a notable situation in the turns presented in the episodes of this research.

Episode 2. The wave towards the coast

Turn 15. PF1: *and what would be necessary?... public policies regarding that?...*

Turn 16. L10: *well, uh:... **public policies** in this case... if:: uh:: health is to be free, right?... for example, in the USA you have to pay to have health care, right?... and here we do not need to pay... **but there is not much investment in health**... not at the moment, I can perceive...*

Turn 17. PF1: *uh-huh*

Turn 18. L10: *Professor regarding **basic sanitation**... Drinking water... sewage, all of this... automatically if you do not have basic sanitation... **sand you do not have drinking water... if you do not have education... You will spend more on health... so... public policies themselves.***

Turn 19. PF1: *Anyone else?*

Turn 20. L8: *I, professor... have finished... the ecosystemic health model.... it is a style to be adopted... generally, a healthy body... helps with physical disposition... taking care of health depends a lot on ourselves... social well-being... and:: and **health also depends on all prerequisites... significant investment in... basic sanitation** as I had already mentioned... and invest significantly so that the SUS can... can serve the entire population multiple times... I have seen people in the SUS in huge lines... it is necessary to facilitate access for people... to this in an adequate manner...*

In episode 2, we again notice the presence of the biopsychosocial model; however, the discourse of the graduating student L8, without interference from the mediating teacher, presents the ecosystemic model. In episode 1, Turn 10, we identified that he was in search of information, while in episode 2, Turn 20, he presents the answer. We observe that, due to the way the discussion process occurs, even if L8 conducted a quick search, it is possible that he already

possessed an understanding of the health models, due to the fact that he was emphatic and pointed directly to the ecosystemic model. However, it is important to highlight that this trainee already possesses experiential knowledge of the subject, as he studied in other countries, thus having the opportunity to draw a parallel between the health conditions of Brazil and those of the other countries in which he lived. Gomes and Minayo (2006, p.12) explain that the ecosystemic model is the "interdisciplinary integration of health and the environment through the development of science and technology, generated and applied in accordance with public and private managers, civil society, and the affected population segments."

We observe that, in turn 15, PF1 directs the dialogue regarding the health understandings of the trainees, as social issues and public policy matters began to emerge. In this context, the intervention of the teacher trainer in the process of constructing learning is noteworthy, promoting discussions and understandings regarding the theme. This is evidenced in the speech of L10, in turn 18, when establishing health relations as a right and responsibility of the government. In this process, we rely on Vigotski's (2008) approach to analyze the intentional action of the teacher trainer. For the author, learning is only possible if the more capable partner, that is, the teacher, assists with appropriate guidance and directions on the subject. This mediation must respect the capacity that each student has to acquire knowledge, considering the prior knowledge of the student. This idea is made explicit in the dialogue excerpts of PF1 and the trainees L10 and L17, in turns 15, 16, 17, and 18. It is a fundamental element, as it is through this process that the higher psychological functions (HPF), specifically human ones, develop.

PF1 questions the meaning of the responses presented by the trainees; thus, this process encompasses the issue of the teacher's mediation, which characterizes the relationship of man with the world and with other men. This is of fundamental importance, precisely because it is through this process that the HPF, specifically the human ones, develop. Thus, between the stimulus and the response, consciousness aims at the possibility of the learning dynamic. The action for consciousness is based on real knowledge, already acquired or already "known"; the teacher's mediation aims to enhance learning, making the cut according to the historical-social context of the student.

We propose that an essential aspect of learning is the fact that it creates the zone of proximal development; that is, learning awakens various internal development processes that can only operate when the child interacts with people and their environment and when cooperating with their peers. Once internalized, these processes become part of the acquisition of independent children's development. (Vigotski, 2008, p. 118)

The discussions involving health education directed towards teaching are generally conducted in schools. Although educating for health is the responsibility of different social segments, teaching, from a holistic perspective of health, in the initial training process, brings to society a professional prepared for the context he will encounter. Therefore, it is essential that the trainees have a basic understanding of public policy issues, which are directly linked to the discussions involving health education, as established by the Federal Constitution⁴. Thus, for the teacher in initial training to understand health education in the school

context, it is necessary for him to know its assumptions, to ensure that, in the future, in the exercise of his teaching, health issues are addressed in a manner that encompasses social determinants such as basic sanitation, access to housing, and public health, as well as environmental issues. In this way, it is necessary to know and discuss the HE in order to broaden the understanding of the subject.

When questioning the students about the scenes from the film "The Constant Gardener" that they had not yet pointed out, we noted the political and economic issues that are evident in the words of student L8: *"I really enjoy discussions about scientific knowledge regarding necropolitics, this politics of death... this politics of death is more visible in poorer countries... when these billionaires... they play a game to... take from the middle classes... for example, it is evident in Libya when Gaddafi was restructuring the country... and these billionaires, this 1%, had no way out... because the country was moving towards a well-structured form... they found strategies to overthrow Gaddafi and succeeded because they are billionaires and capitalism... the country nowadays is like?... one of the poorest in Africa... this politics takes everything from the poorest... it is associated with this politics/necropolitics and is well associated... they launch things for the poorer society to make it even more difficult... for example, they start to take away education so that the people cannot understand and have a vision to overcome difficulties..." They continue to be even richer with this pandemic... the rulers do not govern for the people... but govern for the great billionaires, the 1% that dominates the world... this politics is seen in poor countries..."*

In this excerpt, alongside the analyzed episodes, we once again note the social context influencing the discussion. When we finished the class, the student requested to make his observations about the film and the theme. In his speech, we observe that he is the subject who was present in the social context of that event. L8's speech is closely related to the theme discussed in class, as it presents the interrelations of health and social issues. In this sense, we understand with Nascimento *et al.* that "teaching sciences in the current scenario requires that teachers/mediators fight against the inequalities imposed by capital and the exercise of power and open new horizons for students, in order for them to develop humanly and integrally" (2010, p. 245).

With the movement caused by the winds, the waves were directed towards the coast, making it perceptible to identify how comprehensive the theme of health is. In the speeches, we observe that social and political issues are strongly present and have been associated with the lack of health and quality of life of the populations.

From the analysis, we highlight the important role of the mediating teachers in transforming the process, as the "blowing of the wind," which was light and gentle, gained strength, awakening new feelings and enabling new knowledge on the part of the Biological Sciences students, evidenced in their writings and statements, in which they present reflections on the relationship between health and social determinants, as well as the importance of caring for mental health. This wind, which can cause fear wherever it passes, by modifying the environment and sometimes causing irreversible damage and losses, can also bring relief, like rain in an arid climate, or small changes in the sea breeze,

perceptible in the change of the movement of the waves, thus initiating a new process in the teaching environment and new understandings regarding health.

Just as the movement of the wind, in qualitative research, the process is as important as the product. When the waves began to change direction, new themes emerged, such as health and social well-being, the relationship between health and the social context, the understanding that without access to education, there will be more health expenses, access to better living conditions, public policies, and health as a right for all, thus highlighting the nuances of the process. This movement indicated that the students expanded their understandings of health through the mediation of the teachers and interaction with others. This movement of the winds highlights the importance of the methodological process of research, as the micro-analytical process of Vygotsky (2008) contrasts with an analysis by elements, but rather, with cuts of investigative interest. In this perspective, the guidance of Carvalho (2015) contributed to the construction of the scenes, with faithful records to the original context, providing reliability and understanding to the data. Thus,

Recognizing this set of "versions" of microgenetic analysis as a productive theoretical-conceptual vein, as a search for advances in historical-cultural investigation and, in particular, as a methodological configuration employed in a richer manner than can be inferred from the "definitions" typically presented. These are contributions of great heuristic value, in which the broad vision of dialogism, the concern with discursive functioning, and the examination of indexical aspects allow for a deeper examination of the intersubjective process and expand the possibilities of relating macro-events and the cultural context, based on a genetic-historical understanding. (Goés, 2000, pag 21)

In the presented formative context, a wave formed from discussions about health and Health Education, such that the winds guided it towards the shore, which we identify as the development of new understandings on the subject. The guidance provided by the teachers brought forth new discussion points, initiating a significant effort in the scientific literacy process by emphasizing and highlighting the importance of training in Health Education during initial teacher education. The adopted methodology enabled the analysis of the scenes, considering the intricacies of the process. Thus, the winds pass, and the process restarts, following new directions and originating new movements.

CONCLUSION

It is not possible to control the movement of the winds, nor to know their outcome. In conducting this investigation, we noted that we could not predict the results. Upon analyzing Scene 1, "The blowing of the wind, gaining strength," we observed that the students' baggage is vast and diverse. Thus, the mediation carried out with the researched students in episodes 1 and 2, through the use of cinema as a pedagogical tool, demonstrates that the training process depends on social interactions and the mediation of a more experienced individual, so that there can be a discussion capable of provoking new directions for the winds that blow.

By bringing the metaphor of the movement of winds into the discussion of health and Health Education in the teaching of Sciences, more specifically

regarding the initial training of Biological Sciences teachers, it is necessary to reflect on how scientific and technological production influences formative processes. This is because the production of scientific knowledge, at different stages of training, constitutes an essential activity, so that the student has access to a diversity of knowledge, broadening their understanding of the social context in which they are inserted.

Thus, it is emphasized that teacher training should be for the social, promoting an education that is capable of providing citizens with a form of knowledge that allows them to perceive and act in the face of a reality that, at times, deprives them of their own rights. The discussion of Health Education shows how important it is, in the initial training process, to provide education that fosters the development of students' critical thinking, making them reflective, autonomous, and capable of making informed decisions regarding individual and collective health.

By defining the metaphor of this research as a strategy to investigate the understandings and discussions about the theme of health and Health Education present in the discourse of teachers in initial training for Biological Sciences, the thesis defended by Vygotsky (2008) becomes evident, which argues in his works and research that the social environment in which a person is inserted directly influences their conceptual development. Such a perspective becomes even more evident when we consider that it is a public higher education institution that encompasses a plurality of subjects from different social contexts, whose discourses reflect their experiences and realities, given that the class is composed of middle and lower-class groups. Thus, the discussion about the lack of basic sanitation and the defense of rights, such as quality healthcare provided by the basic health network and quality education, are real contexts in their lives.

Finally, when evaluating the results of the work, we observed a limiting factor of the research: the reduced number of participants. Possibly, if we had a larger number of subjects, new topics and perceptions could have emerged. Furthermore, we consider that the fact that the investigation was conducted remotely, due to the pandemic, may have restricted interactions between the students and influenced the dynamics and production of data.

However, we recognize that the research contributes significantly to the field of Science Education by demonstrating that formative processes, especially in the realm of Health Education, are influenced by social interactions, pedagogical mediation, and the historical-cultural contexts of the subjects involved. The use of strategies such as cinema, combined with the problematization of the experiences of the students, demonstrates potential to promote a critical, reflective, and socially committed education. As future perspectives, we highlight the importance of expanding investigations that integrate different methodological approaches and formative contexts, deepening the debate on HE and strengthening pedagogical practices that contribute to the formation of scientifically critical citizens in light of their historical and cultural context.

NOTES

1. This text is part of the master's dissertation of the first author.
2. In this text, the metaphor will be used to illustrate the movement of discussion presented in the episodes, The Wind and its Movements. The metaphor was inspired by the literary trilogy "The Time and the Wind" by Érico Veríssimo, a Brazilian novel that narrates the history of Rio Grande do Sul, the border wars, hunger, violence, particularly against women, a plot in which the winds are characters alongside Ana Terra and Captain Rodrigo Cambará. The wind is a natural phenomenon; its intensity depends on atmospheric pressure, topography, and various other factors. The intensity can manifest itself through a breeze on the face that brings momentary peace or through a gale that uproots everything. Therefore, it becomes our metaphor, aligning with the questioning of the role of the mediating teacher in the classroom, who possesses the power of the winds, being capable of leading the student to feel the breeze bringing them peace, or this gale movement in the construction of scientific knowledge. The uncontrollable power of the wind over the sea signifies the power of teaching, of education in the context of knowledge and critical thinking. This movement that begins with calm, the wind in its initial movements, shows us the initial knowledge, the "already known." The movements of the waters due to the interference of the winds originate when the mediating teacher identifies the multiple social contexts that arise and, by utilizing this in the discussion, provokes the waves, a moment when it becomes evident that mediation plays an important role in the construction of knowledge, and upon perceiving the movement that this action has provoked, the waves break on the shore, the breeze blows again, and the movement of the winds restarts, sometimes calm and sometimes aggressive. VERÍSSIMO, E. **O tempo e o vento: o arquipélago**. 3. ed. São Paulo: Companhia das Letras, 2004.
3. The film The Constant Gardener is a fictional cinematic production about drug testing in impoverished areas of Kenya, depicting the concealment of tests that do not support the beneficial use of a drug.
4. The right of all and the duty of the State, guaranteed through social and economic policies aimed at reducing the risk of disease and other ailments, as well as ensuring universal and equal access to actions and services for its promotion, protection, and recovery. (Brasil, 1988, art. 196).

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