


TEACHER TRAINING AND INTERDISCIPLINARITY: REFLECTIONS ON A HUMANIZING PATH FOR EDUCATION <https://doi.org/10.56238/sevened2024.029-041>**Diego Alexandre Divardim de Oliveira¹ and Ana Luiza Ruschel Nunes²****ABSTRACT**

This article addresses the discrepancy between the dynamism of contemporary society and the traditional educational model, which is still fragmented, decontextualized and outdated. Although society and technology evolve rapidly, the school remains divided into subjects that often do not communicate with each other or with the lives of students. Education, to be meaningful and effective, must integrate the disciplines and connect knowledge to the students' reality. Paulo Freire and Rubem Alves point out that the traditional system limits the critical capacity and potential of students. Interdisciplinarity emerges as an alternative to overcome this fragmentation, in this sense we sought to bring to this discussion researchers who published in the Interdisciplinarity Journal, led by research professor Dr. Ivani Catarina Arantes Fazenda, between the years 2015 and 2018. This article highlights that education should be more integrated and contextualized, reflecting the complexities of the real world and promoting a more holistic and critical formation of the human being. The approaches discussed include the need to reformulate teacher training to incorporate interdisciplinary practices and the importance of dialogue between theory and practice. The lack of resources, infrastructure and resistance to the traditional model are challenges identified. The article concludes that in order to improve education, it is essential that teachers are in constant training, the need to promote continuous training for teachers and to rethink the curricular structure, seeking a more integrated and collaborative approach. Educators must take a proactive and political role in educational transformation.

Keywords: Education. School. Teacher training. Interdisciplinarity. Transformation.

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INTRODUCTION

Contemporaneity is marked by a large communication network, in which a significant amount of information circulates, which is not static, the result of a dynamic society. Although we can perceive this dynamism present in society and its great technological development, we realize that the current school format is very old, that is, it is a school subdivided into disciplines, which, most of the time, do not dialogue with each other, much less with the lives of individuals. Alves (2012) raises a question that corroborates this idea, for the author,

The classic methods of school torture such as the paddle and the rod have already been abolished. But can there be greater suffering for a child or adolescent than to be forced to move through a forest of information that they cannot understand, and that they seem to have nothing to do with their life? (ALVES, 2012, p.18).

For Freire (1979), education needs to make sense, and the interactions between subjects are fundamental aspects for the construction of knowledge. Alves (2012, p.29), in turn, considers that the traditional, disciplinary, "sedimented" model suppresses the ability of individuals to think, thus, for him, "sedimented knowledge saves us from the risks of the adventure of thinking". We can consider that, in the context of the disciplinary school, individuals are deprived of exercising their potential, teachers and students are limited.

The traditional school model, where knowledge is subdivided into disciplines that do not dialogue, is the result of a model of society divided into classes, which does not allow teachers enough structure to make teaching more meaningful and emancipating. The State does not offer the time and material conditions necessary for the development of interdisciplinary and transdisciplinary projects in schools and Higher Education Institutions, nor do we find adequate conditions.

Therefore, in an attempt to produce an article that discusses the production of knowledge about interdisciplinarity in education and that are published in national journals, we went in search of these materials available on the internet, taking into account that in contemporary times the internet is an important means of dissemination and sharing of knowledge. In the beginning it seemed like an easy task, but during our research we realized its degree of difficulty when selecting articles published in national journals that dealt with the theme of interdisciplinarity in teacher training, and that came in line with critical theories of education.

After many hours of research, it was possible to verify that there are few publications on the subject in question and that most of them are published in the Interdisciplinarity



Journal, a journal created in 2010 by Prof. Dr. Ivani Catarina Arantes Fazenda³ with the collaboration of Prof. Dr. Herminia Prado Godoy. The Interdisciplinarity Journal aims to disseminate the research carried out by GEPI - Study and Research Group in Interdisciplinarity and partners dedicated to the theme, seeking to broaden the debates contributing to the construction of theoretical/practical knowledge in the area of education, art, culture, among others.

For the construction of this article, we chose the period between 2015 and 2018, when 8 editions of the aforementioned journal were published. Unfortunately, after 2018, there were no more publications in that journal. After reading those copies, we selected 12 articles published in that quadrennium, as we considered the discussions shared in them appropriate for this reflection.

DISCUSSION

About the conception of Interdisciplinarity, Fazenda (2015) says that there are two approaches that need to be considered when talking about interdisciplinary teacher training, the first concerns a scientific order, and the second focus concerns a social order.

Scientific knowledge would lead us to the construction of what we would call interdisciplinary knowledge. The organization of such knowledge would be based on the core of the scientific knowledge of the act of training teachers, such as the hierarchical structuring of the disciplines, their organization and dynamics, the interaction of the artifacts that compose them, their conceptual mobility, the communication of knowledge in the sequences to be organized. This proposition would lead to the search for disciplinary scientificity and with it the emergence of new epistemological motivations, of new existential frontiers. Therefore, we understand the following: each discipline needs to be analyzed not only in the place it occupies or would occupy in the grid, but in the knowledge it contemplates, in the concepts enunciated and in the movement that these knowledges engender, typical of its locus of scientificity. This scientificity, then originating from the disciplines, gains *the status* of interdiscipline at the moment when it forces the teacher to review his practices and rediscover his talents, at the moment when the movement of the discipline is incorporated from the world. (FAZENDA, 2015, p.10).

In this sense, social ordering aims at the "unfolding of interdisciplinary scientific knowledge to social, political and economic demands" (FAZENDA, 2015, p.10).

Such a conception calls into question the entire separation between the construction of the sciences and the solicitation of societies. In the limit, we would say more, that this ordering tries to capture all the complexity that constitutes the real and the need to take into account the interactions that are constitutive of it. It studies methods of analyzing the world, as a function of social purposes, emphasizes the impasses experienced by scientific disciplines in their impossibilities of facing complex problems alone (FAZENDA, 2015, p.10).

³ He began his research on interdisciplinarity in the 1970s (note by the authors).



There are demands that need to be met, which concern the socio-political-cultural factors that require new postures from the subjects (FAZENDA, 2015). The author takes into account that capitalism is one of the driving forces that end up influencing education, and that one cannot confuse school interdisciplinarity and scientific interdisciplinarity.

In school interdisciplinarity, the perspective is educational, so school knowledge comes from a different structure from that belonging to the constitutive knowledge of the sciences. In school interdisciplinarity, the notions, purposes, skills and techniques aim to favor, above all, the learning process, respecting the students' knowledge and its integration (FAZENDA, 2015, p.12).

School interdisciplinarity emphasizes processes, and in this context teacher training needs to be in accordance with this perspective. In this way,

The interdisciplinary training of teachers, in fact, should be seen from a circumdisciplinary point of view, as we have discussed with Yves Lenoir, where the science of education based on a set of principles, concepts, methods and purposes converge on a meta-scientific plane. In this case, we deal with what we could call synthesizing and dynamic engaging interaction, reaffirming the need for a dialectical, non-linear and non-hierarchical structure, where the professional act of different knowledge constructed by teachers is not reduced only to disciplinary knowledge. We begin here to deal with a new, recently researched subject called educational intervention where more important than the product is the process that begins and remains in the maintenance of Human Rights (FAZENDA, 2015, p.14).

When talking about teacher training, from an interdisciplinary perspective, it is essential to consider that the relationship between theory and practice needs to be based on critical awareness, which recognizes the incompleteness of the processes and the need to go beyond the conventional. For Martins; Tavares (2015, p.19)

Thinking about teaching practice is a constant reflective exercise of each educator committed to education. It is a very challenging moment, since it is necessary to self-analyze all the work done by the teacher, in a political conjuncture in which there is no real commitment to the student or even to the educator. However, this reality, although harsh, should not prevent the realization of such a practice that is so valid not only for the teacher, but for the educational system itself.

Thinking about interdisciplinarity implies thinking about the other and the collective, it is a humanitarian practice. In the meantime, Martins and Tavares (2015, p.26) demonstrate the

[...] need to bring to the classroom the interdisciplinary attitude of sensitive listening so that each teacher can act in an interdisciplinary way of being. There are many paths of interdisciplinarity and one of them is revealed through psychopedagogical practice, since this professional is a kind of bridge that connects the family and the school through paths that are sometimes long and tortuous.



By taking this idea into account, it is possible to reflect on the teaching practice of many teachers, who often seek to give meaning to the contents they teach, are attentive to students and their needs, collaborate for good coexistence at school, among many things, act in an interdisciplinary way even though they do not recognize that these practices are interdisciplinary.

[...] according to Ivani Fazenda, Interdisciplinarity is much more than a junction of disciplines, it is a new vision of the possibilities of relationship between them and between the fundamental issues of contemporaneity, which would allow the replacement of the truth of each discipline by the truth of man as a being in the world (FAZENDA, 2011a, p. 89) (FERNANDES, 2015, p.52).

According to Fernandez (2015), an interdisciplinary project demands dialogue and the appreciation of the human being. Lima (2016, p.70) says that "human beings learn to live" and that "the contents of the curriculum should not be presented in a disconnected way" and, for the author, it is important to take into account the complexity that exists in relationships, and this ends up impacting the production of knowledge in education and, as a result, changes in teaching methodologies arise, as stated by Mateus (2016). Like this

[...] Interdisciplinarity in the school environment has been suggested, by some scholars in education, as a methodological alternative to overcome fragmented teaching, being able to enhance a greater meaning to school contents, contributing to a more holistic education that prepares for life. According to Japiassú (1976), it is characterized by the "intensity of exchanges between specialists and the degree of real integration of the disciplines" in the same research project to interpret learning situations (OLIVEIRA et al. 2016, p.35).

According to Oliveira et al. (2016), interdisciplinarity does not reduce and does not annul the disciplines, but promotes interconnections between them, enabling greater integration between subjects (teacher, student and community), which contributes to the construction of new knowledge that is meaningful to all. Oliveira et al. (2016, p.36) state that for this to occur, it is necessary for teachers to be "open to seek the construction of a curricular proposal contextualized with the school reality in the perspective of forming citizens committed to the social transformation of their community".

Complementing the above, and recalling what has already been said before, the State does not provide the infrastructure for teachers to work with interdisciplinary, transdisciplinary and multidisciplinary projects. Today, when we talk about innovative projects, we remember the relevance of Freire's (2002) and Hernández' (1998) thinking, for the former education is a political act and, for the latter, it speaks of transgression.

I cannot perceive myself as a presence in the world, but at the same time explain it as the result of operations absolutely alien to me. In this case, what I do is renounce the ethical, historical, political and social responsibility that the promotion of support



for the world places on us. I renounce participating, fulfilling the ontological vocation of intervening in the world. The fact of perceiving myself in the world, with the world and with others puts me in a position in front of the world that does not belong to those who have nothing to do with it. After all, my presence in the world is not that of those who adapt to it, but that of those who are inserted in it. It is the position of those who struggle not only to be an object, but also a subject of History (FREIRE, 2002, p.23).

This is a very important posture that needs to be assumed by everyone, especially by all people who call themselves educators, because it is through education that the rest of the population will become more aware and critical of the contexts in which they live.

Regarding the fragmentation of the curriculum, decontextualization, and a transgressive posture, Hernández (1998, p.12) says that

[...] it seeks to transgress the vision of the school curriculum centered on the disciplines, understood as fragments packaged in closed compartments, which offer the student some forms of knowledge that have little to do with the problems of knowledge outside the School, which are far from the demands that different social sectors propose to the school institution and that have the function, above all, to maintain forms of control and union power on the part of those who conceive themselves rather as specialists than as educators.

Oliveira et al. (2016) conducted a survey with a group of teachers from the state of Espírito Santo, and verified aspects that we had already observed in loco in the state of Paraná. It was found

Another conviction that is crystallized in most teachers, and why not say in school, is the resistance to change, because the main goal is not in the integral formation of young people, but in complying with the programs of the disciplines. It was observed among the teachers the difficulty in detaching from programs and contents, which they said were mandatory because they were listed in the state curriculum. This obligation is reinforced in the statement of the supervision that assigns the collection to the superintendence and external evaluations, especially the PAEBES⁴ (OLIVEIRA et. al, 2016, p.43).

Ram; Silva (2017) conducted a research in a public high school in the municipality of Senhor do Bonfim, in the State of Bahia, and pointed out that

The main difficulties pointed out by the professors to carry out interdisciplinary activities between these disciplines⁵ were: lack of time available to plan and execute the activities; absence of theoretical references on the theme interdisciplinarity to assist in planning; lack of knowledge of practical examples of how to carry out interdisciplinary activities; scarcity of resources; deficiency in training and lack of interaction with professors from other areas. The latter being the most addressed (CARNEIRO; SILVA, 2017, p.39).

⁴ Basic Education Evaluation Program of Espírito Santo (PAEBES). (note by the authors)

⁵ Biology and Mathematics. (note by the authors)



In the two studies mentioned, we can see that there are two aspects that end up impacting education, in order to hinder possible changes in the perspectives of education, from a disciplinary education to interdisciplinary education. The first concerns the State's lack of interest in any non-traditional educational perspective, and the second concerns the teachers' lack of interest in transgression in education. We can consider that the teachers who participated in these researches need a lot of will and boldness to break with the traditional disciplinary model, which would require a lot of effort and dedication.

As a possible solution to this situation, Mello (2016, p.29) proposes a change in teacher training and corroborates our reflections by saying that

The rupture of the dichotomy between theory and practice presents itself as a possibility for formative integration. Contrary to the fragmentation of concepts, we then resort to the conception of formative integration as a result of several dimensions of education that, articulated, contribute to the full condition of the subject, first as a human, and then as a professional. We propose a break with curricular fragmentation, in order to allow, through practices, to integrate separate knowledges, contributing to the contextualization of the reality in which we live. [...] That said, the great challenge for formative integration is to overcome the fragmentation, which persists in our teacher training course curricula.

The fragmentation of knowledge causes subjects to lose the ability to perceive the whole and to contextualize (MELLO, 2016).

Thus, interdisciplinarity appears as an action, a form of analysis of the world, helping scientific knowledge, supporting disciplines and even helping in issues that disciplinarity alone cannot handle. It is interdisciplinarity seeking within the sciences an internalization to then move on to exteriorization, thus being able to try to respond to emerging social issues (REIS, 2017, p.16).

interdisciplinarity is a dialogical proposal that seeks to integrate subjects, society and knowledge (REIS, 2017). It is a way of humanizing and making the human being more critical, contributing to the recognition of himself as a historical subject who needs to act in the world, not as a passive subject, but performing all his modifying potential.

Still on teacher training, Frade et al. (2017) report experiences with the Interdisciplinary PIBID of the Federal University of Lavras, in the State of Minas Gerais, which is based on Paulo Freire's critical pedagogy, which promotes an organization of knowledge that enables the flow of generating themes, in addition to highlighting the importance of collaborative work. In this project

[...] the strategy used for the integration of the various areas of knowledge was the practice of weekly meetings for study, planning, review, construction and selection of materials for the Culture Circles. By debating the generating themes arising from the exchanges carried out in the schools, the students and supervising teachers were able to build scripts for the work, so that the integration of the areas was present. It was defined by using available technological resources, such as: documentary



videos, *online reports*, audios, photographs, among others, to introduce the generating themes of each Culture Circle. By experiencing the collaborative construction of these didactic materials, the integration of knowledge was guaranteed. Students from the various teaching degrees were given the opportunity to experience the interdisciplinary construction of didactic-pedagogical planning through dialogue and exchange of information (FRADE et al. 2017, p.47).

To find the generating themes, the researcher needs to be inserted in the reality that is being researched, in this case the school reality. In Freire (1979) we perceive that this practice is political, as it contributes to unveiling realities and, in this way, frees subjects from oppressive forces.

Men, as "beings-in-situation", are submerged in spatio-temporal conditions that influence them and in which they also influence. They will reflect on their character as situated beings, to the extent that they are challenged to act. Men are because they are situated. The more they reflect critically on their existence, and the more they act on it, the more men they will be. Education and thematic research in a critical conception of education are only different moments of the same process (FREIRE, 1979, p.24).

There are no subjects who are not situated, even in cases of anchoritism the relationship of the subjects with the environment where they live is an active relationship that needs to be critical and reflective. On this issue, we have the example of Henry David Thoreau who lived alone⁶ on the shores of Walden Lake, in the State of Massachusetts, USA, and that he was a critical observer of his reality. Thinking from this example, let us think that students often do not have enough maturity to be critical and reflective observers, so teachers need to provoke young people by inviting them to reflect and contextualize, because according to Lima; Monteiro (2018, p.21) "interdisciplinarity goes beyond the curriculum and epistemological points of convergence, it is intentional action and involves cultural and social aspects". In this sense, teachers need to be open to the new methodological outlines that emerge when the old paradigms of education are broken.

Viçosa et al. (2018) state that it is necessary to strengthen the continuing education of elementary school teachers with a view to interdisciplinarity, collaborative work, and the construction of knowledge in networks. "This construction occurs from the exchange of experiences that generate questions that allow us to understand different issues in groups constituted in the education networks" (VIÇOSA et al. 2018, p.96).

[...] We consider that it is essential to adapt or restructure the current programs of initial and continuing training of elementary school teachers that include improvements in interdisciplinary aspects. As a suggestion for overcoming the difficulties presented, regarding the approaches to the environment and interdisciplinarity, Shaw, Rocha and Folmer (2017) are cited, who highlight the role

⁶ Thoreau lived as a hermit during the years 1845 and 1847, his experience was reported in the work "Walden or Life in the Woods" first published in 1854. (note by the authors)



of university research professors as guides and stimulators of discussions. Thus, to soften the dissociation between disciplinary and pedagogical content, to reduce the distance between academia and the school reality, to invest in the constitution of work networks and training practices based on exchanges and professional dialogue, centering these trainings in schools, around projects that are, at the same time, pedagogical innovation and teacher training (VIÇOSA et al. 2018, p.96).

It is very important that teachers know the Pedagogical Political Project of the institution where they are inserted and, in an eventual restructuring, the demands of contemporaneity are considered and that this restructuring is carried out collectively (VIÇOSA et. al., p.96). According to the above, teachers need a sense of belonging. Education needs to be built collectively.

FINAL CONSIDERATIONS

As much as the world is in continuous scientific and technological development, and it is also possible to verify changes occurring in the cultural aspect through acculturation and endoculturation, many of these changes occur due to globalization. Even in a dynamic world, the current school format is outdated.

We need to reflect on the initial and continuing education of teachers from an interdisciplinary perspective, in order to promote the understanding of the world in a global, contextualized and critical way, valuing all subjects and stimulating them to build knowledge in a collaborative way.

Valuing education as a means of transforming society is essential when it comes to the quality of teaching, therefore, educators should not wait for the initiative of the State for the necessary changes to occur. In the meantime, Ribeiro (1979, p.14) demonstrates the relevance of his thought when he states that "the educational crisis in Brazil that is so much talked about is not a crisis, it is a program. An ongoing program, whose fruits, tomorrow, will speak for themselves."



REFERENCES

1. CARNEIRO, R. R. S., & SILVA, L. M. (2017). Prática interdisciplinar no ensino da hereditariedade em escolas estaduais de Senhor do Bonfim, BA. **Interdisciplinaridade**, 1(10), 31-40.
2. FAZENDA, I. C. A. (2015). Interdisciplinaridade: didática e prática de ensino. **Interdisciplinaridade**, 1(6), 9-17.
3. FERNANDES, P. J. C. (2015). Desafios para a efetivação de um projeto interdisciplinar na contemporaneidade: um diálogo com Jürgen Habermas e Ivani Fazenda. **Interdisciplinaridade**, 1(6), 44-55.
4. FRADE, E. et al. (2017). Os pilares da interdisciplinaridade no subprojeto do PIBID Interdisciplinar na Universidade Federal de Lavras, MG. **Interdisciplinaridade**, 1(10), 41-58.
5. FREIRE, P. (1979). **Conscientização: teoria e prática da libertação**. São Paulo: Cortes e Moraes.
6. FREIRE, P. (2002). **Pedagogia da autonomia**. São Paulo: Paz e Terra.
7. HERNÁNDES, F. (1998). **Transgressão e mudança na educação: os projetos de trabalho**. Porto Alegre: Artmed.
8. LIMA, K. O. (2016). A teoria e a prática interdisciplinar no cotidiano profissional do pedagogo. **Interdisciplinaridade**, 1(9), 69-80.
9. LIMA, K. O., & MONTEIRO, G. V. (2018). Epistemologia ecossistêmica e interdisciplinaridade: uma parceria necessária ao ensino escolar do século XXI. **Interdisciplinaridade**, 1(12), 9-31.
10. MARTINS, E. C., & TAVARES, D. C. (2015). A escuta sensível: prática do docente interdisciplinar no ensino médio. **Interdisciplinaridade**, 1(6), 18-27.
11. MATEUS, L. (2016). A percepção interdisciplinar do aluno do curso técnico em enfermagem sobre cidadania. **Interdisciplinaridade**, 1(9), 47-57.
12. MELLO, M. P. R. A. (2016). Currículo e integração formativa nos cursos de formação de professores. **Interdisciplinaridade**, 1(9), 24-40.
13. OLIVEIRA, E. B. et al. (2016). Os desafios da interdisciplinaridade no currículo da área das ciências da natureza de uma escola estadual. **Interdisciplinaridade**, 1(9), 31-47.
14. REIS, R. A. (2017). O contexto escolar em análise: as práticas interdisciplinares e as mudanças no cotidiano escolar. **Interdisciplinaridade**, 1(10), 9-30.
15. RIBEIRO, D. (2018). Sobre o óbvio. Disponível em: <<http://www.sociologiaonline.com/wp-content/uploads/2015/08/sobre-o-obvio.pdf>>. Acesso em: 30 mai. 2018.



16. VIÇOSA, C. S. C. L. et al. (2018). Desafio da formação continuada em abordagens acerca do meio ambiente em uma perspectiva interdisciplinar. **Interdisciplinaridade**, 1(12), 83-102.