SEVEN
publicações acadêmicas

Science teaching, pedagogical principles of rural education and fishing community as conceptual categories: A brief state of the art

Crossref doi
https://doi.org/10.56238/Connexpemultidisdevolpfut-072

Larissa Hayannyelly Costa Batista
Master in Education, Cultures and Identities from the Federal Rural University of Pernambuco (UFRPE), Professor of Chemistry at the Secretariat of Education and Sports of Pernambuco (SEE-PE).
E-mail: larissa-h.2@outlook.com

Gilvaneide Ferreira de Oliveira
Post-doctorate in Transdisciplinary Teaching from the Federal University of Rio Grande do Norte (UFRN), Professor of the Graduate Program in Education, Cultures and Identities of the Federal Rural University of Pernambuco.
E-mail: gilvaneide.oliveira@ufrpe.br

ABSTRACT
In order to know from the most holistic perspective possible the field in which it is intended to delineate research, it is important that a brief exploration of the conceptual categories targeted is first developed. In this sense, this article is a bibliographic study and aims to understand which and how the conceptual categories contained in national works connect with Science Teaching. Thus, the first part of the study reflects the link between the conceptual categories Science Teaching and pedagogical principles present in Rural Education as Contextualization and Interdisciplinarity. The second part of the study will relate Science Teaching and the Fishing Community. The study is composed of 73 national works and was carried out from the Google Scholar platform because it necessarily contemplates various types of research. It was possible to visualize that exploratory research that crosses conceptual categories in order to observe similarities and disparities contained in the works, whether in methods, objectives, or discussions, is extremely important for a better visualization of the study area, consequently contributing to the construction of a work that knows and recognizes the discussions directly or indirectly related to research.

Keywords: State of the art, science teaching, conceptual categories, pedagogical principles, fishing community.

1 INTRODUCTION

As a way of knowing from a more holistic perspective the field in which it is intended to outline research, it is important that first a brief exploration of the conceptual categories targeted, whether primary or secondary (FERREIRA, 2002). In this sense, the present article arises with the intention of externalizing brief research that composes the body of the state of the art of the dissertation project of the Graduate Program in Education, Cultures and Identities of the Federal Rural University of Pernambuco.

Researchers such as Romanowski and Ens (2006), express the idea and need for the composition of the state of the art to better know the evolution of the discussions of the field of study beyond observing only the focus/objective of the works, but also to stick to the issues of specificities regarding the region in which the research is developed, year, intrinsic conceptual frameworks,

developing institutions, methodology, discussions, theoretical references and other important aspects that characterize the works. According to the authors on studies in education:

> [...] It can be said that there is a lack of studies that carry out a balance and refer to the need for a mapping that unveils and examines the knowledge already elaborated and points out the approaches, the most researched themes and the existing gaps. (ROMANOWSKI AND ENS, 2006 p. 38)

It is from this mapping that it becomes possible to classify and consequently compare in terms of singularities and disparities. In this sense, the justification is due to the fact that the construction of the state of the art is as important to observe how the works have been developed, as to raise possible discussions in relation to existing productions and, in this case, to understand the field in which research can and will develop.

Thus, the present work has as general objective to understand which and how the conceptual categories contained in national works connect with the Teaching of Sciences, from the study and classification of 73 works researched and accessed via Google Scholar, a platform chosen for necessarily contemplating various types of research. It is important to point out that this work is methodologically fragmented into two parts, the first is composed of 67 works and emphasizes the general crossing of the primary category (Science Teaching) with the secondary categories, respectively Curriculum and the pedagogical principles of rural education as Contextualization and Interdisciplinarity. The second part is composed of 06 works, emphasizing the primary category (Science Teaching) and a special secondary category that expresses the locus of the study, which is Fishing Community.

2 METHODOLOGIES

The present study is based on the qualitative approach, characterized by the search for the understanding of one or more phenomena, taking the investigator as the main instrument in the capture of information (MEDEIROS, 2012). In this perspective, it was used as a data collection technique the bibliographic research characterized by focusing on materials that have not yet received analytical treatment, also understood by the possibility of subsidizing information found in other sources (GIL, 2008). This type of research is, above all, a proposal for the production of new knowledge, consequently creating new ways of understanding the phenomena studied (SÁ-SILVA; ALMEIDA & GUINDANI, 2009).

To reach the intended objectives, the study on the existing bibliographies was developed on the Google scholar platform. The motivation for the choice was the scope of the platform, which despite containing specifications, displays any type of work, that is, regardless of the nature (articles,

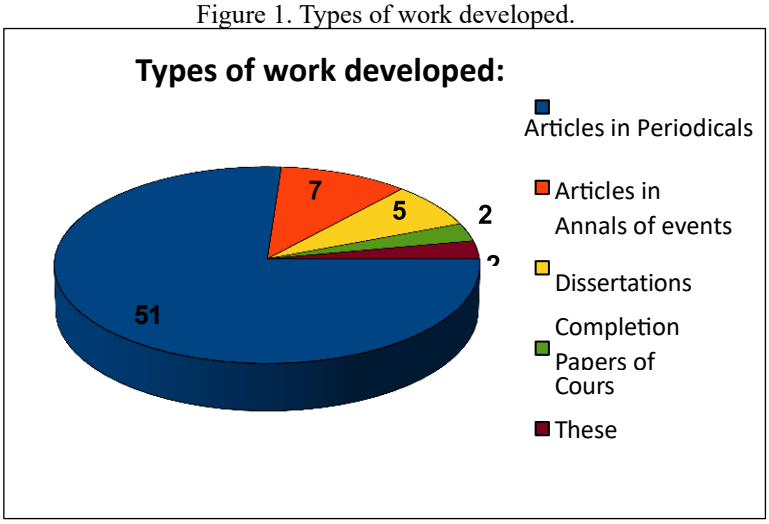
proceedings, theses and dissertations), of the institutions involved, including their repositories, journals, events, among other specificities.

3 RESULTS AND DISCUSSION

3.1 SCIENCE TEACHING, CONTEXTUALIZATION AND INTERDISCIPLINARITY: A GENERAL STUDY

The first part of the present state of the art will encompass five aspects: 1. Type of work developed; 2. Developer institutions; 3. Characteristics of the research; 4. Year of publication and 5. Secondary conceptual categories. Due to the size of the study, considerations will be woven from graphs. Below, in Figure 1, we can observe the types and quantity of studies developed contemplating the aforementioned categories.

Figure 1. Types of work developed.

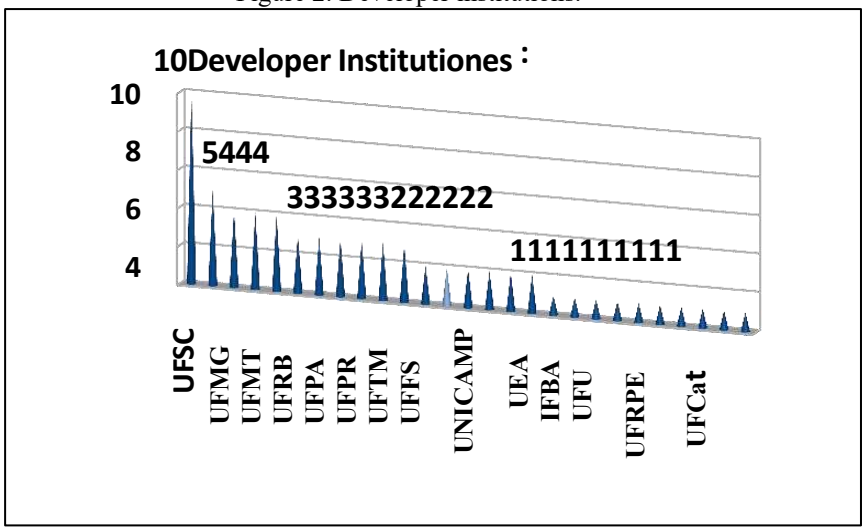


Source: The Author, 2021.

From Figure 1 it is important to consider that 51 or 76.12% of the works developed are articles, which points to the promotion of Course Conclusion Works (TCC), Theses and Dissertations, which together do not compose 1/4 of the study. The need is given by the nature of the work, the deepening of the problems, the understanding, discussions and results. The promotion of degrees in rural education, post-graduations and especially rural schools, which together make up the locus of research is important for the development and deepening of works of this nature.

The amount of work developed when there is a strong rural education policy increases exponentially. This perspective takes strength when we observe in Figure 2 the universities that most develop work, and in which region they are located.

Figure 2. Developer institutions.



Source: The Author, 2021.

It is possible to observe from Figure 2 that the universities in the south of the country are the ones that most develop works contemplating rural education and teaching and sciences, adding the works of the Federal University of Santa Cataria (UFSC), Federal University of Pampa (UNIPAMPA), Federal University of Rio Grande do Sul (UFRGS), Federal University of Santa Maria (UFSM) and Federal University of Paraná (UFPR), account for 26, or 38.67% of the works, followed by the Northeast region with 13, or 19.40%, Midwest with 11, or 16.42%, Southeast region with 7, or 10.45%, and North region with 6 jobs, or 8.95%.

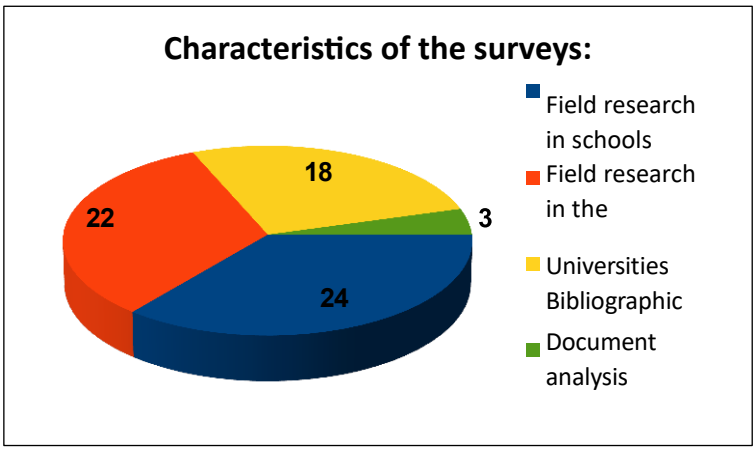
It is important to emphasize that the amount of work is directly proportional to the influence of field education in the format of undergraduate, graduate and especially rural school. UFSC has a degree in rural education, as well as UNIPAMPA, UFCat, UFRGS, UFSM, UFMT, UFS, UFRB, UFPA, UnB, UFPR, UFTM, UFG, UFFS, UFPI, FURG, UEA, IFPA, IFBA, UNIFESSPA, UFGD and UFMG. Only UFRPE, UNESP and UNICAMP do not yet have a degree in rural education, UFU does not have an undergraduate degree, but has specialization in rural education, as well as UNIPAMPA that has a specialization course in science teaching in rural education, UFSC that has a specialization in field education for interdisciplinary work in the areas of natural sciences and mathematics, UFRB has a professional master's degree in rural education, IFPA has a specialization in rural education, agroecology and pedagogical issues, UFPR, UFFS and UFPI have a specialization in rural education, and UEA has a specialization in rural education – knowledge of the land.

The panorama that we have assembled is important for the present work, because assuming the feedback, we observe that UFRPE has been moving in the direction of strengthening the courses with the perspective of rural education, such as the course of Agroecology in Alternation regime, the research and extension projects, the degree course in rural education in the final construction phase and many other works.

This movement of valorization of the schools of the countryside is important, because it drives the pulverization of the idea for the creation and strengthening in the change of the logic of the schools in the field, to also of the field. Regarding the offer in rural education courses in the northeast, Molina and Hage, (2016, p. 814) argue that [...] the north and northeast, which have much higher deficits of field teachers without graduation, offer only 32.8% of the vacancies in contrast to the other regions, which offer twice as many vacancies, that is, 67.2%".

Considering the feedback between the research locus, Figure 3 shows us notes on the characteristics of the studies developed.

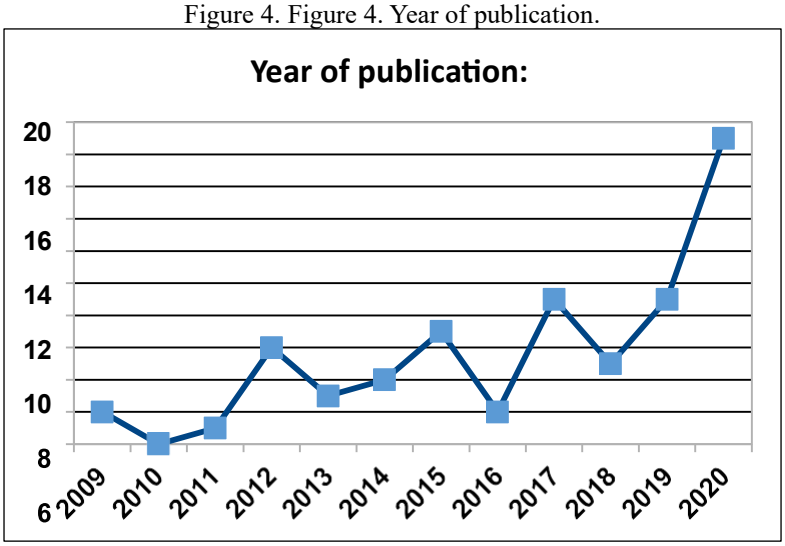
Figure 3. Characteristic of the researches.



Source: The Author, 2021.

It is possible to observe from Figure 3, that joining the categories field research in schools and field research in universities, the number of works developed in the context of practice reaches 46, or 68.66%. The bibliographic research and documentary analyses when unified in a single category correspond to almost 1/3 of the total of the studies, but this is due to the amount of work developed in 2020, in the context of the COVID-19 pandemic, an issue that Figure 4 will address below.

Figure 4. Figure 4. Year of publication.

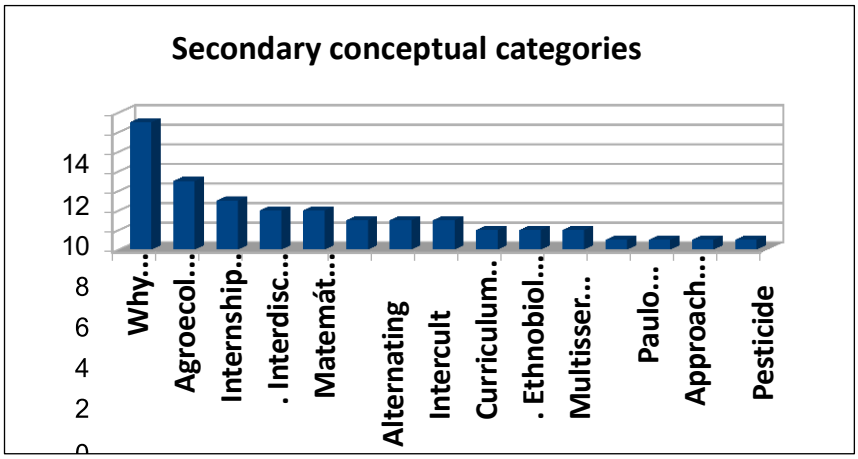


Source: The Author, 2021.

From Figure 4 it is possible to visualize the gigantic leap in the production of works contemplating the Teaching of Sciences and Rural Education. The first hypothesis/variable for assessment is that the creation of specialization at UFSC and UNIPAMPA addressing the two categories helps in the production of works in this perspective, it is no wonder that the two universities together have 15, or 22.38% of the works developed. The second hypothesis is that the production of the works more than doubled in relation to the previous year to the detriment also of the COVID-19 health crisis, this is because even the works published in 2020, and that were developed in schools with programs of initiation to teaching, internship, extension or in licentiates, are from previous years.

In this sense, as a way to observe even more with conceptual categories that emerged during the study, we will observe Figure 5 below.

Figure 5. Figure 5. Secondary conceptual categories.



Source: The Author, 2021.

From Figure 5 it is possible to observe that most of the studies (18 or 26.86%) are developed in the scope of teaching. Other categories that appear with great force allied to the teaching of sciences are agroecology and the discipline of mathematics, curious, because the two areas (mathematics and science) share a lot of tension by the contentist abstractions.

Following the columns of data we have the Alternation with three works, this is probably due to the influence of the Family Centers in Training by Alternation (CEFFA) and the Agricultural Family Schools (EFA) existing in the developing regions. Also with three works, we have Curriculum and, interculturality, issues that permeate the education of the field between the organization of the school and the reality of the community.

Contextualization is very important for the study and appears in two works. The first work is very recent and was developed by Ferreira and München (2020), a documentary analysis that identified the relationships between contextualization, the teaching of Natural Sciences and Rural Education. The second work is an article by Cardoso (2009), who sought to investigate to what extent the recontextualizing dimensions are developed in science classes in rural schools in the Sergipe backlands.

Another very important category is Interdisciplinarity and appears four times in the research, the first is in the article by Mello et al, (2015) characterized by describing an experience of science teaching in a rural school in the north of Mato Grosso, highlighting the methodology of Alternation. The second is a recent literature review by authors Sául and Muenchen (2020), who looked at the way interdisciplinarity is presented in the Degrees in Rural Education in the Area of Natural Sciences.

The third work is the article by Mueller, Mello and Oliveira (2012) and brings a proposal for classes in Natural Sciences and Mathematics, involving the disciplines of Mathematics, Biology and Chemistry. The fourth and final work was developed by Campos, Silva, Freitas and Monteiro (2015), and identified which characteristics interdisciplinarity in the PPC allows to establish a relationship between the Pedagogy of Alternation and the Teaching of Science and Mathematics.

Other categories with a work appear in addition to those on the chart, in this case, thematic approach, pesticides, biology and notebooks, appear in alphabetical order, together with the Science Club; Knowledge; Speech; Active school; Specifics; Study of Art; Cultural studies; School Garden; Dialectical historical materialism; Methodologies; Socialist pedagogy; Pedagogical practicesIndigenous Territory, categories that did not fit in the graph.

3.2 CROSS-REFERENCING OF THE CATEGORIES SCIENCE TEACHING AND FISHING COMMUNITY

In view of the nature of the research, many works in the first part of this study separately contemplate some of the categories, however when we come to the second part of the state of the art

and cross the two categories Science Teaching and Fishing Community, the number is restricted to six works.

It is important to consider that the first work of Bejarano et, al., (2014), analyzes the knowledge of crustacean biology of young people in the community through prior knowledge that the school is not inserted in the community in an attractive way, the proposed activities further confirmed the hypothesis through the high degree of interest in the practice by the fishing students. The second work of Pérez et, al., (2019), deals with the vision that students have of the researcher through the methodology of the researcher Molina.

The third work of the authors Silva and Baptista (2018), was one of those that focused on the first part of the study. The research is a theoretical review and presents valuable data and discussions on the importance of traditional knowledge for the curriculum. The fourth production is more robust, a dissertation by the author Brunet (2006), guided by Bejarano, author of the first work with the young fishermen of the same community, Baiacu, on the island of Itaparica-BA, the author raised the vast knowledge that elementary school children had about mangroves, and especially about crustaceans, knowledge that was passed from generation to generation.

The fifth work of the author Araújo Junior (2019) has a didactic sequence approach and aimed to streamline the teaching strategies for the exercise of teaching, the researcher's gaze turns to the non-Formal space as a pedagogical tool. The sixth production is a didactic guide to a project produced by the authors Valério and Leite (2017), and consisted of carrying out practical activities related to the processing and processing of fish from the region. The work was supported by aspects of the Science, Technology and Society (STS) and Science, Technology, Society and Environment (CTSA) approach and sought to carry out interventions with high school students from IFES.

4 FINAL CONSIDERATIONS

It is possible to observe with this brief mapping that the development of studies in education, especially linked to municipalities characterized as field, is directly connected to the existence of places for the development of these works, that is, undergraduate courses in rural education, post-graduations and in particular, rural schools, even if they are not CEFFAs or EFAs. It is also possible to note that academic production is important beyond articles in journals and events, because the quantitative difference between these and more in-depth studies such as TCCs, dissertations and theses, is enormous. Another issue is that the development of these studies has also been growing and this can be linked to the health crisis of COVID-19, an issue also linked to the greater production of works with bibliographic reviews and documentary analyses.

It is important to cross conceptual categories in order to observe similarities and disparities in the following aspects, which weigh in the study that is intended to be developed later, these are: Theme,

Intentionality, Justification, Conceptual categories covered, Objectives, Methodology and Theoretical References.

In this sense, it is possible to conclude that carrying out exploratory work in the state-of-the-art format is extremely important for a better visualization of the field of study, especially to better understand the types and characteristics of productions in the area. Investing in a state of the art is not only for the escape of similarity between researches, but to know works in their amplitude, opening space for discussion, experimentation and sharing of experiences, consequently contributing to the construction of a research that knows and recognizes the themes, concepts and methods directly or indirectly related to the research itself.

REFERENCES

Araújo júnior, josivan fernandes de. A sustentabilidade em espaços de educação não-formais: possibilidades pedagógicas da reserva de desenvolvimento sustentável estadual ponta do tubarão (rdsept). 2019. 127f. Dissertação. Mestrado profissional em ensino de ciências naturais e matemática - centro de ciências exatas e da terra, universidade federal do rio grande do Norte, natal, 2019.

Bejarano, nelson rui ribas; brunet, joana maria soler; bandeira, fábio pedro souza de ferreira and bortoliero, simone terezinha. A vida de alunos pescadores da comunidade de baiacu (bahia) e sua relação com a escola: dois mundos distintos? Ciênc. Educ. (bauru) [online]. 2014, vol.20, n.1, pp.159-173. Issn 1980-850x. Brasil. Constituição brasileira de 1988.

Britto, n. S. Silva, t. G. R, da. Educação do campo: formação em ciências da natureza e o estudo da realidade. Educação & realidade - issn 0100-3143 (impresso) e 2175-6236 (online) v.40 n. 3 2015.

Brunet, j. M. S. Aratus, caranguejos, siris e guaiamuns, animais do manguezal: uma etnografia dos saberes, técnicas e práticas dos jovens da comunidade pesqueira de baiacu (ilha de itaparica-ba). Dissertação, universidade de federal da bahia (ufba) e universidade estadual de feira e santana (uefs), 2006.

Cardoso, l. R. Araújo, m. I. O. Currículo de ciências: professores e escolas do campo. Revista ensaio | belo horizonte, v.14, n. 02 p. 121-135. 2012.

Cardoso, lívia de rezende. Processos de recontextualização no ensino de ciências da escola do campo: a visão de professores do sertão sergipano. 2009. 179 f. Dissertação (mestrado em educação) - universidade federal de sergipe, são cristóvão, 2009.

Costa, l. G. Da; m. S. Aikawa; cunha, i. Da s. Ensino de ciências: uma discussão na perspectiva da educação do campo. Revista amazônica de ensino de ciências | issn: 1984-7505 rev. Reté | manaus | v.7 | n.13| p.161-169| jan-jun| 2014.

Ferreira, norma sandra de almeida. As pesquisas denominadas “estado da arte”. Educação & sociedade, ano xxiii, no 79, agosto/2002.

Ferreira, m. A. München, s. A contextualização no ensino de ciências: reflexões a partir da educação do campo. Dossiê educação do campo e suas interfaces com o ensino de ciências vol. 3, n. 4, issn 2595-4520, 2020.

Gil, antônio carlos. Como elaborar projetos de pesquisa. 4. Ed. São paulo: atlas, 2008.

Medeiros, marcelo. Pesquisas de abordagem qualitativa rev. Eletr. Enf. 2012 abr/jun;14(2):224-5. Disponível em: http://www.fen.ufg.br/revista/v14/n2/v14n2a01
.htm. Acessado em: 10/03/2021.

Mello, g. J.; campos a. G. De; senra, r. E. F.; mueller, l. C. E. R; mello, i. C. De. A educação do campo na amazônia legal, caminhos que se cruzam entre agrotóxicos, agroecologia e ensino de ciências. Experiências em ensino de ciências v.10, no. 2. 2015.

Molina, m.c. E hage, s. M. Riscos e potencialidades na expansão dos cursos de licenciatura em educação do campo. Rbpae - v. 32, n. 3, p. 805 - 828 set./dez. 2016.

Mueller, e. R.; mello, g. J.; oliveira, v. S. Ensino de ciências e matemática na amazônia legal: o processo de definição dos conceitos da abordagem na educação do campo. Universitas humanas, brasília, v. 9, n. 1, p. 31-40, jan./jun. 2012.

Pérez, d. F. V; almeida, r. O. De; santos, e. S. Dos; paiva, c de j.; santos, a. De c.; santos, m. C. Dos; silva, a. De a.; dourado, c. A.; fonseca, j. De o. El-hani c. N. Interpretando narrativas sobre pesquisa no discurso de crianças da comunidade pesqueira de siribinha (conde, ba). Xii enpec universidade federal do rio grande do norte, natal, rn – 25 a 28 de junho de 2019.

Romanowski, joana paulin; ens, romilda teodora. As pesquisas denominadas do tipo "estado da arte" em educação. Revista diálogo educacional, vol. 6, núm. 19, septiembre-diciembre, 2006, pp. 37-50 pontifícia universidade católica do paraná paraná, brasil. Issn: 1518-3483

Sá-silva, jackson ronie; almeida, cristóvão domingos, guindani, joel felipe. Pesquisa documental: pistas teóricas e metodológicas. Rev. Bras. De história & ciências sociais. N. I, p. 1-15, jul., 2009.

Sául, t. S.; muenchen, c. Licenciaturas em educação do campo nas ciências da natureza: um olhar para suas especificidades. Educação em revista. Belo horizonte
V.36 e 223382. 2020.

Silva, m. L. S; baptista, g. C. S. Conhecimento tradicional como instrumento para dinamização do currículo e ensino de ciências. Gaia scientia. Volume 12 issn 1981-1268. 2018.

Valério, v. H. Da s. Leite s. Q. M. Projeto escolar redepesca: cidadania e educação profissional à luz dos estudos cts/ctsa.– vitória: instituto federal de educação, ciência e tecnologia do espírito santo. Série guia didático de ciências; isbn: 978-85-8263-255-0, 2017.