SCIENTIFIC LITERACY AND OMNILATERAL TRAINING IN PROFESSIONAL AND TECHNOLOGICAL EDUCATION

O LETRAMENTO CIENTÍFICO E A FORMAÇÃO OMNILATERAL NA EDUCAÇÃO PROFISSIONAL E TECNOLÓGICA

LITERACIDAD CIENTÍFICA Y LA FORMACIÓN OMNILATERAL EN LA EDUCACIÓN PROFESIONAL Y TECNOLÓGICA

Websa Paula Souza SILVA[1]
e-mail: websa.paula@estudante.ifgoiano.edu.br

Suelen Marçal NOGUEIRA[2]
e-mail: suelen.nogueira@ifgoiano.edu.br

Rhanya Rafaella RODRIGUES[3]
e-mail: rhanya.rodrigues@ifgoiano.edu.br

How to reference this article:

SILVA, W. P. S.; NOGUEIRA, S. M.; RODRIGUES, R. R. Scientific literacy and omnilateral training in Professional and Technological Education. **Revista Ibero-Americana de Estudos em Educação**, Araraquara, v. 19, n. esp. 2, e024083, 2024. e-ISSN: 1982-5587. DOI: https://doi.org/10.21723/riaee.v19iesp.2.18809

| **Submitted**: 14/12/2023
| **Revisions required**: 29/02/2024
| **Approved**: 19/03/2024
| **Published**: 20/07/2024

[1] Instituto Federal Goiano (IFGoiano), Campus Ceres – GO – Brazil. Master's student in the Master's Program in Professional and Technological Education.
[2] Instituto Federal Goiano (IFGoiano), Campus Ceres – GO – Brazil. Visiting professor of the Master's Program in Professional and Technological Education. PhD in Health Sciences (UFG).
[3] Instituto Federal Goiano (IFGoiano), Campus Ceres – GO – Brazil. Coordinator and Professor of the Master's Program in Professional and Technological Education. PhD in Literature and Linguistics (UFG).

ABSTRACT: Scientific literacy is configured as a possibility to promote omnilateral training through access and understanding of scientific research. This research aims to carry out a bibliographical review on the role of scientific literacy for omnilateral training in Integrated High School. To understand the topic, the concepts of Professional and Technological Education (EPT), Integrated Secondary Education (EMI) (Ramos, 2014) and scientific literacy are addressed and discussed. This bibliographical review enabled us to observe that, in the context of EMI, scientific literacy presents itself as a possibility for the student's comprehensive training, as well as for the popularization of Science and Technology in EPT.

KEYWORDS: Literacy. Scientific Literacy. Integrated High School. Professional and Technological Education.

RESUMO: *O letramento científico se configura como uma possibilidade para favorecer a formação omnilateral por meio dá acesso e compreensão de pesquisas científicas. Esta pesquisa tem como objetivo realizar uma revisão bibliográfica sobre o papel do letramento científico para a formação omnilateral no Ensino Médio Integrado. Para a compreensão sobre a temática são abordados e discutidos os conceitos de Educação Profissional e Tecnológica (EPT), Ensino Médio Integrado (EMI) e letramento científico. Esta revisão bibliográfica nos possibilitou observar que, no contexto do EMI, o letramento científico se apresenta como uma possibilidade para a formação integral do estudante, bem como para a popularização da Ciência e Tecnologia na EPT.*

PALAVRAS-CHAVE: *Letramento. Letramento Científico. Ensino Médio Integrado. Educação Profissional e Tecnológica.*

RESUMEN: *La literacidad científica se configura como una posibilidad para la formación omnilateral a través de la comprensión de investigaciones científicas. Esta investigación presenta como objetivo la realización de una revisión bibliográfica sobre el papel de la literacidad científica para la formación omnilateral en la Enseñanza Media Integrada. La comprensión de la temática discutida abarca las concepciones de Educación Profesional y Tecnológica (EPT), Enseñanza Media Integrada y literacidad científica. Esta investigación bibliográfica se presenta como una posibilidad para la formación integral del estudiante y para la popularización de la ciencia y tecnología en la EPT.*

PALABRAS CLAVE: *Literacidad. Literacidad Científica. Enseñanza Secundaria Integrada. Educación Profesional y Tecnológica.*

Introduction

Professional and Technological Education (EPT) refers to a modality of education proposed through the National Education Guidelines and Bases Law (LDB) 9,394/96, which integrates the dimensions of work, science and technology. Work as an educational principle, training for the world of work and omnilateral training represent the main objectives of EPT (Ciavatta, 2014; Frigotto, 2009; Ramos, 2014; Saviani, 1994).

Integrated Secondary Education (EMI), offered in the educational context of EPT, allows students in the last stage of basic training (High School) to also have access, in an integrated manner, to a technical course. In this way, EMI integrates the training of students in both basic and technical disciplines. Considering the objectives of EPT and EMI's premise of training citizens to act in the world of work, the development of full reading comprehension capacity is considered essential, including texts that present the results of scientific research, which can be implemented in the daily practice of the worker in training.

As Kleiman (2022) argues, it is necessary for the teacher to have a critical and reflective approach when teaching reading, so that the student can go beyond mere decoding (identification of letters, words and phrases), and achieve a deep understanding of the text read (literacy). In view of the above, to understand the discussion encompassed in this research, it is essential to understand the state of the art regarding the role of scientific literacy as a way of contributing to the omnilateral training of students linked to the EMI. It is worth noting that a previous exploratory survey carried out in the Digital Library of Theses and Dissertations (BDTD) and in the Professional Master's Observatory in Professional and Technological Education (PROFEPT) indicated that there is still a gap on the topic in the scope of the EMI.

Based on the importance of scientific literacy for the preparation of EMI students, as well as the low number of research carried out on the scope, this article presents a bibliographical survey, with a qualitative approach, in which the concepts of EPT, EMI and about scientific literacy (Ciavatta, 2014; Frigotto, 2009; Ramos, 2014; Cunha, 2019). The objective, from this study, is to carry out a bibliographical review on the role of scientific literacy for omnilateral training in Integrated High School. It is hoped that this research will enable reflection on the importance of training working citizens who are capable of reading, interpreting and applying the results of scientific studies in their professional practices. Initially, the concept of EPT is discussed, then Integrated Secondary Education is discussed and, finally, Scientific Literacy is discussed.

Professional and Technological Education omnilateral training

The history of professional and technological education (EPT) is marked by struggles of the working class against the forces governed by capital (Frigotto; Ciavatta, 2003). Class struggle is a term created and discussed by Marx (2004) to differentiate the proletariat that sells its labor power to survive and the bourgeoisie, which owns the means of production. Marx (2004) argued that, over time, the capitalist system created growing economic and social inequality between the bourgeoisie and the proletariat. In this context, the theorist defines capital as "value that appreciates", which means that, in the capitalist system, the main objective is the search for profit and accumulation of wealth through the production and sale of goods. In this way, capital is not just a quantity of money or assets, but rather a dynamic social relationship in which money is invested in production to generate more value, that is, more profit.

From a capitalist perspective, it is understood that for capital to be valued, the exploitation of wage labor is necessary. Marx (2004) argued that, in capitalism, workers sell their labor power to the bourgeoisie in exchange for wages. In the field of education, this discussion had repercussions in the defense that teaching is not in favor of capital, but that it promotes the emancipation of subjects, encouraging them to think critically about this form of oppression by capital (Frigotto; Ciavatta, 2003).

From this perspective, EPT is configured as a training space that seeks to prepare students to act in a critical-reflective way in the world of work. However, the objective of EPT was not always based on a perspective of liberation and integral training of students. It is necessary to contextualize that EPT emerged in Brazil at the beginning of the 20th century. According to Minuzzi, Machado and Coutinho (2022), its first cycle is characterized as “training a good citizen”, that is, the aim was to transform the so-called 'destitute of luck' into people who could work to have dignity. In this context, the separation between general propaedeutic training, known as common training for higher education, and technical training, specific to manual work in factories, was praised. Throughout the 20th century, EPT presented different evolutions, in which citizens, belonging to the most popular classes, were prepared for work, from a professionalization perspective, that is, they were taught how to exercise a profession in a totally technical, without any critical reflection or development of other skills.

According to Arroyo (2019), EPT has questions that arise from attempts to integrate high school with technical training. These questions seek to overcome the duality between the right to general education and professional technical training. Therefore, the integration

between basic and technical disciplines needed to be considered as an object of transformation from a merely professional education to an integral professional education for the working class, which provides them with support for an emancipatory human formation.

After many struggles, challenges and setbacks faced in the name of an education understood as humanizing, unitary, omnilateral and polytechnic that enables the working class to understand the development of productive forces to train people for work, law 11.892/2008 was created, the Federal Network for Professional, Scientific and Technological Education (RFEPCT) which covers the Federal Institutes (IFs), the Federal Centers for Technological Education (CEFETs) and Colégio Pedro II (Brasil, 2008; Ciavatta; Ramos, 2011).

From the emergence of this legislation, it was possible to offer specialized education in science and technology through Integrated Secondary Education (EMI), which enables integration between regular and technical training. From this perspective, we seek to train citizens in an omnilateral way, which can be understood "[...] in the sense of training the human being in its physical, mental, cultural, political, scientific-technological integrality" (Ciavatta, 2014, p. 190). In other words, omnilateral training refers to the development of the subject's different potentialities, expanding beyond mere preparation to perform a function uncritically.

Still with regard to omnilaterality, Della Fonte (2018) presents the term omnilateral as a mention of becoming communist, in this sense, the author states that omnilaterality is the essence of the human being, of what he does in a full, entire way, doing part of what he produces and taking possession of what he produced. It is from omnilateral training that it is possible to achieve the Marxist conception of "education of the future". We need this conception to advance with a counter-hegemonic education, with a view to guaranteeing the emancipation of human beings, as well as enabling the articulation of human dimensions (omnilateral) with work, through work as an educational principle.

According to Ciavatta (2014), there are different aspects that must be developed in a context of integral human training, such as social and scientific-technological. However, the author reflects on a possible difficulty in promoting the scientific-technological aspect. From this perspective, Moura (2017) states that the scientific-technological dimension must be developed intentionally, seeking training in science based on ethical rationality, which is the critical consciousness of individuals, not placing oneself at the service of capital.

Science, in turn, is one of the dimensions that EPT is guided by and is present at all levels of EPT, being observed mainly in the verticalization of teaching characteristic of Federal Institutes. In other words, at RFEPCT, a context in which EPT is mostly offered in Brazil, it is

possible for the student to study EMI, Higher Education and Postgraduate Studies at the same institution. In this way, omnilateral training enables the multiple formation of individuals, aiming at the freedom and autonomy of the working class to overcome the structural duality brought by capitalism.

Based on the above, EPT appears to have a fundamental role in the emancipation of subjects, especially the working class in the counter-hegemonic struggle. Under this perspective, the role of EPT goes beyond mere professionalization, which according to Arroyo (2019) is the disarticulation between basic training and professional training, as it seeks to promote omnilateral and complete training for students to act in an active and critical manner in the world of work. EPT reflects hope for those who believe in complete training that dignifies working men.

In the next subsection, the discussion on EMI as a training space that enables students' development through work is deepened.

Integrated High School and work as an educational principle

Gramsci (apud Nosella; Azevedo, 2013) departs from the Marxist theory about work to question the school system, investigating the presence of two types of schools, for two types of existing classes: a school disinterested in work, for the elite, with broad content cultural and humanist for those who don't need to worry about work so early; and another school interested in work with superficial content and of a professional nature, for a less favored class that needs immediate work.

The conception of work as an educational principle emerges, from Marxist theories, as a defense of the unification between manual work and intellectual work, allowing the overcoming of capital and the historical duality of social classes. It is important to highlight that overcoming capitalism is not a simple process, as it requires educational approaches and collective actions at various levels of society. However, work as an educational principle can play an important role in the formation of critical, conscious and capable individuals, who are able to contribute to the construction of alternatives to the capitalist system and the search for a more just and unitary society.

This work-based teaching approach values practical experience and the application of knowledge in real contexts, rather than just emphasizing the theoretical transmission of information. Saviani (1994) emphasizes that work as an educational principle must continue to

be the basis of training in the context of new technologies and new forms of work. From this angle, the unitary school, proposed by Gramsci (2001) as a possibility of overcoming duality and based on work as an educational principle, can inspire students to become agents of social change. By experiencing the positive impact that their work can have on society, they can be motivated to seek forms of transformation that go beyond capitalist structures, aiming to build an egalitarian society.

According to Della Fonte (2018), work forms and deforms, so that, from an ontological perspective, human beings construct themselves while working. However, this does not happen when work is treated as something merely employment and marketing. The term "ontological work" can be understood as a philosophical approach that relates human work to the construction of one's own existence and identity, therefore, work is the essence of man (Saviani, 2007). The author is based on the idea that work plays a central role in the formation of human beings and the creation of meaning in their lives. This vision of work is what we seek for transformative education within EMI.

Based on the central role of work for human training, EMI represents the possibility of integration between propaedeutic and technical training, in the final phase of Basic Education. Ciavatta (2008) discusses the integration of high school with technical education, prioritizing integrated courses and their contributions to the working class. Therefore, Frigotto (2009) explains the importance of this training space that involves young people, teachers, researchers and in a context that prepares them for action in the world of work.

EMI is an educational model in which students have the opportunity to combine common learning, that is, general, known as propaedeutic, with technical or professional training, such as the technical course in agriculture (Ciavatta; Ramos, 2011). Traditional high school consists only of the general part, for this reason, EMI presents a difference by integrating technical education with basic training. According to Ciavatta (2008), integration means seeking that general education and professional training become a single training for work, without separation and fragmentation. Furthermore, the author argues that adopting the EMI enables broader and more effective preparation for working in the world of work, in a broad, polytechnic way and mediated mainly by science and technology.

From this perspective, the EMI, in addition to representing the hope of overcoming the structural duality of classes, promotes bringing Basic Education students closer to scientific knowledge (Kuenzer, 2000). Another benefit related to EMI, according to Leite (2017), is the rapprochement between theory and practice that makes it possible to apply the knowledge

acquired in the classroom to real situations related to the technical knowledge studied. EMI is also a possibility for including intellectual and cultural activities in schools. According to Saviani (2007), the opportunity to develop scientific and critical thinking about work practice represents an opportunity to overcome the simplification of manual work that was carried out in factories and industries.

EMI is considered the closest we have to a unitary education (Gramsci, 2001), since the integration between technical and propaedeutic knowledge promotes a difference between other teaching models in secondary and/or vocational education. Integration ensures that the student is able to absorb the completeness of general training combined with specific technical training, in addition to its meaning for society. Based on the fundamental role of EMI in the development of scientific thinking of workers in training, the ability to read and interpret scientific texts is considered a fundamental skill. To expand understanding of the topic, the next subsection discusses scientific literacy, which refers to the development of reading texts linked to scientific genres in the school context.

Scientific Literacy

The full development of citizenship and the ability to act in different contexts, including the world of work, demands that the individual be able to read (decode and understand) written texts, given that in our society the use of written language predominates (Abusamra; Chimenti; Tiscornia, 2021). Along the same lines, Kleiman (2022) states that reading is an essential skill for acquiring knowledge and developing various skills, such as critical thinking, vocabulary and understanding texts. Therefore, it is important that reading practices are comprehensive and integrated into all areas of the curriculum, ensuring that students are able to understand, analyze and interpret texts critically.

However, it is worth highlighting that reading is not an innate skill, that is, it requires formal teaching to be developed (Abusamra; Chimenti; Tiscornia, 2021). From this perspective, Soares (2022) states that in addition to the mechanical reading of words (decoding), literacy must be promoted, that is, the understanding of what is read, that is, it is necessary to attribute meaning to the text read, considering the different types of text, in addition to the social, cultural and historical dimensions that impact the reading and understanding of texts.

Based on Soares (op. cit.), literacy is intrinsically linked to power, social participation and the construction of individual and collective identities. The power related to literacy refers to the ability to read and understand the text, its form, its writing, its characteristics, its function

for society, having criticality, autonomy, mainly, being able to act in a counter-hegemonic position. In this sense, individuals who are not literate or who only decode texts tend to have a more passive, uncritical and non-reflective stance, in addition to being more likely to be exploited in the world of work.

In agreement with the notion of literacy presented above, Kleiman (2022) states that in addition to decoded reading, it is important that students develop critical reading, in which readers are encouraged to question, problematize and analyze texts in a reflective way. In this sense, the theorist asserts that it is necessary for students to develop critical reading skills so that they are able to interpret and evaluate the veracity, intentionality and effects of texts. From this perspective, literacy means enabling the student to go beyond mere reading (decoding), it means introducing practices that lead them to questioning and searching for answers.

It is worth noting that literacy provides for the understanding of texts of different types and genres, including those related to science. From this perspective, Scientific Literacy (CL) involves the reading, writing and understanding skills specific to scientific language (Cunha, 2017). Active participation in the scientific and academic context demands full LC development. Furthermore, the LC can contribute to decision-making based on scientific issues that impact society, such as the understanding and replicability of scientific studies of different natures. The OECD (Organization for Economic Co-operation and Development) describes three necessary skills that students need to have to be considered scientifically literate: explaining phenomena scientifically; evaluate and plan scientific investigations and interpret data and evidence scientifically (Brazil, 2019).

Serrão and collaborators (2016) developed 4 levels to measure CL, namely: i) non-scientific literacy; ii) rudimentary scientific literacy; iii) basic scientific literacy; iv) proficient scientific literacy. The authors carried out a survey that evaluated the level of LC in participants of different age groups. The results showed that 79% of individuals surveyed were between 15 and 40 years old and were classified as belonging to levels 2 and 3 of LC, that is, they have an intermediate level of LC, of which 48% of respondents were classified as having a rudimentary level of LC. LC, and 31% with basic level. The Brazilian Institute of Scientific Literacy (IBLC) and the Carlos Chagas Foundation (FCC) in 2014, developed a survey on the proficiency scale in scientific literacy, the results showed that only 5% of the sample presented a proficient level in reading scientific texts.

The evidence from the research presented above demonstrates that proficient understanding of scientific texts is still very low. Cunha (2017) considers that for CL to be fully

developed, it is essential that there is active participation in the construction of scientific knowledge, instead of teachers simply transmitting information without promoting any type of reflection on texts of the scientific genre. The author also suggests that the exchange of experiences and learning between scientifically literate and non-literate people (people who are not able to read and understand scientific texts) is much more productive than the simple transmission of knowledge.

In short, CL demands the ability to read and interpret, knowledge of scientific methods and vocabulary specific to science (Branco *et al.,* 2018). It is observed that these skills are also considered in the perspective of the student's omnilateral training to act fully and critically in the world of work. Under this perspective, it is necessary for the worker to be able to pay attention to the constant scientific and technological changes currently imposed, which demands proficiency in reading scientific texts.

Final remarks

From carrying out this bibliographical review, it is possible to observe that EPT has a fundamental role in the emancipation of subjects, especially the working class in the anti-class struggle. The role of EPT goes beyond mere professionalization and seeks to promote an omnilateral and complete education for students to act actively and critically in the world of work.

In the scope of EPT, EMI constitutes a fundamental stage of training for work, as it enables the integration between general and technical knowledge, which represents a difference in relation to courses that focus only on teaching basic content (High School) or technical (professional courses) (Ciavatta, 2008).

Carrying out this study made it possible to observe that the development of a proficient level of scientific literacy seems to be essential for the achievement of omnilateral training and for a critical and active role in the world of work. The LC enables the student to be able to intervene in society and the world of work, through the understanding of scientific texts. The LC provides the development of basic skills for workers, such as the ability to question, reflect, analyze and propose solutions. It should be noted that the LC is not limited to language subjects, but covers knowledge in the basic and technical areas.

In view of the above, it is essential that the development of LC is prioritized in the EMI curriculum, which can occur through the reading and interpretation of different scientific texts

(reports, articles, scientific summaries, course completion works, dissertations and theses) and participation in scientific events, groups and research projects.

It is worth explaining that this research refers to an excerpt from a project that is under development and that the next steps envisage the application of a didactic sequence focusing on scientific literacy in the context of EMI, which will enable us to verify, through empirical data, the role LC for omnilateral training.

REFERENCES

ABUSAMRA, V.; CHIMENTI, A.; TISCORNIA, S. **La ciencia de la lectura**: los desafíos de leer y comprender textos. Buenos Aires: Tilde Editora, 2021.

ARROYO, M. G. A educação profissional e tecnológica nos interroga. Que interrogações? **Educação Profissional e Tecnológica em Revista**, [*S. l.*], v. 3, n. 1, p. 5–18, 2019. Available at: https://ojs.ifes.edu.br/index.php/ept/article/view/374/335. Access: 23 May 2023.

BRANCO, A. B. DE G. *et al*. Alfabetização e letramento científico na BNCC e os desafios para uma educação científica e tecnológica. **Revista Valore**, [*S. l.*], v. 3, n. 1, p. 702–713, 2018. Available at: https://revistavalore.emnuvens.com.br/valore/article/view/174. Access: 31 May 2023.

BRASIL. **Relatório Brasil no PISA 2018**. Brasília, DF: Ministério da Educação, 2019. Available at: http://download.inep.gov.br/acoes_internacionais/pisa/documentos/2019/relatorio_PISA_2018_preliminar.pdf. Access: 20 June 2023.

BRASIL. **Lei n. 11.892, de 29 de dezembro de 2008**. Institui a rede Federal de Educação Profissional, Cientifica e Tecnológica. Brasília, DF: Presidência da República, 2008. Available at: https://www.planalto.gov.br/ccivil_03/_ato2007-2010/2008/lei/l11892.htm. Access: 31 May 2023.

CIAVATTA, M. A formação Integrada a escola e o trabalho como lugares de memória e de identidade. **Revista Trabalho Necessário**, [*S. l.*], v. 3, n. 3, p. 1–20, 2008. Available at: https://www.researchgate.net/publication/325954886_A_FORMACAO_INTEGRADA_A_ESCOLA_E_O_TRABALHO_COMO_LUGARES_DE_MEMORIA_E_DE_IDENTIDADE Access: 31 May 2023.

CIAVATTA, M. Ensino integrado, a politecnia e a educação omnilateral. Por que lutamos? **Trabalho e Educação**, [*S. l.*], v. 23, p. 187–205, 2014. Available at: https://periodicos.ufmg.br/index.php/trabedu/article/view/9303. Access: 05 June 2023.

CIAVATTA, M.; RAMOS, M. Ensino Médio e Educação Profissional no Brasil: Dualidade e fragmentação. **Revista Retratos da Escola, Brasília**, [*S. l.*], v. 5, n. 8, p. 27–41, 2012. DOI: https://doi.org/10.22420/rde.v5i8.45 Available at: https://retratosdaescola.emnuvens.com.br/rde/article/view/45 Access: 24 May 2023.

CUNHA, R. B. Alfabetização científica ou letramento científico? Interesses envolvidos nas interpretações da noção de scientific literacy **Revista Brasileira de Educacão**, [*S. l.*], v. 22, n. 68, p. 169–186, 2017. DOI: https://doi.org/10.1590/S1413-24782017226809 Available at: https://www.scielo.br/j/rbedu/a/cWsmkrWxxvcm9RFvvQBWm5s/ Access: 23 May 2023.

CUNHA, R. B. **Por que falar em letramento científico?** Raízes do conceito nos estudos da linguagem. 1. ed. Campinas, SP: Estante Labjor, 2019.

DELLA FONTE, S. S. Formação no e para o trabalho. **Educação Profissional e Tecnológica em Revista**, [*S. l.*], v. 2, n. 2, p. 6–19, 2018. Available at: https://ojs.ifes.edu.br/index.php/ept/article/view/383. Access: 23 May 2023.

FRIGOTTO, G. A polissemia da categoria trabalho e a batalha das ideias nas sociedades de classe. **Revista Brasileira de Educação**, [*S. l.*], v. 14, n. 40, p. 168–194, 2009. Available at: https://www.scielo.br/j/rbedu/a/QFXsLx9gvgFvHTcmfNbQKQL/abstract/?lang=pt. Access: 23 May 2023.

FRIGOTTO, G.; CIAVATTA, M. Educar o trabalhador cidadão produtivo ou o ser humano emancipado? **Trabalho, Educação e Saúde**, [*S. l.*], v. 1, n. 1, p. 45–60, 2003. Available at: https://www.scielo.br/j/tes/a/JSYmSMnc7TKKrxWjm3xHLGd/?lang=pt. Access: 23 May 2023.

GRAMSCI, A. **Cadernos do cárcere**. 2. ed. Rio de Janeiro: Civilização Brasileira, 2001.

KLEIMAN, A. **Oficina de leitura - teoria e prática**. 17. ed. Campinas, SP: Pontes Editores, 2022.

KUENZER, A. Z. O Ensino Médio agora é para a vida: entre o pretendido, o dito e o feito. **Educação & Sociedade**, [*S. l.*], v. 21, n. 70, p. 15–39, 2000. Available at: https://www.scielo.br/j/es/a/LGpgCTxWgVvB3DYzKVWFjwJ/abstract/?lang=pt. Access: 20 May 2023.

LEITE, P. DE S. C. Contribuições do materialismo histórico-dialético para as pesquisas em Mestrados Profissionais na área de ensino de humanidades. **Investigação Qualitativa em Educação**, [*S. l.*], v. 1, p. 847–8561, 2017. Available at: https://proceedings.ciaiq.org/index.php/ciaiq2017/article/download/1405/1362. Access: 20 June 2023.

MARX, K. **O capital**: Livro 1. São Paulo: Editorial Boitempo, 2004.

MINUZZI, E. D.; MACHADO, L. R. DE S.; COUTINHO, R. X. A relação entre o ensino técnico e o propedêutico nas reformas e contrarreformas da educação brasileira. **Revista Contexto & Educação**, [*S. l.*], v. 37, n. 119, p. e13135, 2022. Available at: https://www.revistas.unijui.edu.br/index.php/contextoeducacao/article/view/13135. Access: 20 June 2023.

MOURA, D. H. A formação de docentes para a educação profissional e tecnológica. **Revista Brasileira da Educação Profissional e Tecnológica**, [*S. l.*], v. 3, n. 2, p. 23–38, 2017.

Available at: https://www2.ifrn.edu.br/ojs/index.php/RBEPT/article/view/2863. Access: 23 May 2023.

NOSELLA, P.; AZEVEDO, M. L. N. DE. A educação em Gramsci. **Teoria e Prática da Educação**, [*S. l.*], v. 15, n. 2, p. 25–33, 2013. Available at: https://paginas.uepa.br/gcpi/wp-content/uploads/GRAMSCI_E_A_EDUCACAO_ARTIGO.pdf Access: 20 June.2023.

RAMOS, M. N. O currículo para o Ensino Médio em suas diferentes modalidades: concepções, propostas e problemas. **Educação & Sociedade**, [*S. l.*], v. 32, n. 116, p. 771–788, 2011. Available at: https://www.scielo.br/j/es/a/NrgqwnZ4vG6DP8p5ZYGn4Sm/?format=pdf&lang=pt. Access: 20 June 2023.

RAMOS, M. N. Ensino médio integrado: da conceituação à operacionalização. **Cadernos de Pesquisa**, [*S. l.*], v. 19, n. 39, p. 15–29, 2014. DOI; https://doi.org/10.22535/cpe.v0i39.10243 Available at: https://periodicos.ufes.br/educacao/article/view/10243 Access: 15 May 2023.

SAVIANI, D. O trabalho como princípio educativo frente as novas tecnologias. **Novas tecnologias, trabalho e educação: um debate multidisciplinar**, p. 151–168, 1994.

SAVIANI, D. Trabalho e educação: fundamentos ontológicos e históricos. **Revista Brasileira de Educação**, [*S. l.*], v. 12, n. 34, p. 152–180, 2007. Available at: https://www.scielo.br/j/rbedu/a/wBnPGNkvstzMTLYkmXdrkWP/?format=pdf&lang=pt Access: 20 May 2023.

SERRAO, L. F. S. et al. A experiência de um indicador de letramento científico. **Cadernos de Pesquisa**, [*S. l.*], v. 46, n. 160, p. 334–361, 2016. DOI: https://doi.org/10.1590/198053143498 Available at: https://www.scielo.br/j/cp/a/k7d6r8nVhKfRM38yLnHRNKt/ Access: 20 May 2023.

SOARES, M. **Letramento**: um tema em três gêneros. 3. ed. Belo Horizonte: Autêntica, 2022.

Acknowledgments: We thank IF Goiano for the support given to carry out and disseminate this study.

Financing: IF Goiano.

Conflicts of interest: There are no conflicts of interest regarding the content developed in the text.

Ethical approval: Not applicable.

Availability of data and material: Not applicable.

Author contributions: The first author carried out the bibliographical research and implemented the methodology while the second and third author directed the reflections, as well as discussions with analysis of the content to be described and discussed, corrections and formatting.

Processing and editing: Editora Ibero-Americana de Educação.
Review, formatting, standardization, and translation.