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ARTICLE

The scientific evidence-based approach to education in teacher education: *retreat from the practice*[1]

Catia Piccolo Viero Devechi[I]
Amarildo Luiz Trevisan[II]
Ângelo Vitório Cenci[III]

ABSTRACT

This article presents the perspective of Brazilian education specialists on the evidence-based approach to education in teacher education. Using Habermas's (1987) reconstructive hermeneutics, it explains the result of a questionnaire that asked education specialists about the meaning of the approach when dealing with teacher education. From the 25 researchers consulted, four were in favor of the proposal, while 21 were against it. Considering that the National Education Council has been leading education policies in a unidirectional way and without creating opportunities for opposite positions, the purpose of the research was to open a space for discussion on the subject, bringing the silencing present in the proposal to light. In summary, most researchers point out that the legitimacy of teacher education comprises intentionality, and involves an ethical posture, context and human education that is not simply built nor springs from empirical facts.

KEYWORDS

evidence-based education; reconstructive hermeneutics; teacher education.

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[I]Universidade de Brasília, Brasília, DF, Brazil.
[II]Universidade Federal de Santa Maria, Santa Maria, RS, Brazil.
[III]Universidade de Passo Fundo, Passo Fundo, RS, Brazil.

A ABORDAGEM DA EDUCAÇÃO BASEADA EM EVIDÊNCIAS CIENTÍFICAS NA FORMAÇÃO DE PROFESSORES: RECUO DA PRÁTICA

RESUMO

O artigo apresenta o olhar de especialistas da educação brasileira sobre a abordagem da educação baseada em evidências na formação dos professores. Utilizando-se da hermenêutica reconstrutiva de Habermas (1987), explicita o resultado de um questionário que inquiriu especialistas da educação sobre o sentido da abordagem quando tratamos da formação de professores. Dos 25 pesquisadores consultados, quatro posicionaram-se favoravelmente à proposta, enquanto 21 foram contrários. Considerando-se que o Conselho Nacional de Educação vem protagonizando políticas de educação de forma unidirecional e sem oportunizar o contraditório, o propósito da pesquisa foi abrir um espaço de discussão sobre o assunto, trazendo à luz os silenciamentos presentes na proposta. Em síntese, a maioria dos pesquisadores afirma que a legitimidade da formação de professores compreende intencionalidade e envolve postura ética, contexto e formação humana que não se constrói sobre nem brota de fatos empíricos, simplesmente.

PALAVRAS-CHAVE

educação por evidências; hermenêutica reconstrutiva; formação de professores.

EL ENFOQUE DE LA EDUCACIÓN BASADO EN LA EVIDENCIA CIENTÍFICA DE LA FORMACIÓN DE PROFESORES: RETROCESO DE LA PRÁCTICA

RESUMEN

El artículo presenta la perspectiva de los especialistas en educación brasileña referente al enfoque de la educación basado en la evidencia de la formación de profesores. Utilizando la hermenéutica reconstructiva, de Habermas (1987), explica el resultado de un cuestionario en el que se preguntaba a especialistas en educación sobre el sentido del enfoque cuando se aborda la formación de profesores. De los veinticinco investigadores consultados, cuatro se mostraron a favor de la propuesta, mientras que veintiuno estuvieron en oposición. Considerando que el *Conselho Nacional de Educação* viene conduciendo las políticas educativas de manera unidireccional y sin crear espacios para la oposición, el propósito de la investigación fue abrir un espacio de discusión sobre el tema, sacando a la luz el silenciamiento presente en la propuesta. En síntesis, la mayoría de los investigadores señalan que la legitimidad de la formación docente comprende la intencionalidad, involucra una postura ética, el contexto y la formación humana que no se construye ni surge de hechos simplemente empíricos.

PALABRAS CLAVE

educación por evidencia; hermenéutica reconstructiva; formación de profesores.

INTRODUCTION

In this paper, we aim to present the perspectives of specialists in Brazilian education on the evidence-based approach in teacher education. Inspired by evidence-based medicine, this approach has been incorporated into the national literacy program and, consequently, into teacher education. The policy is perceived as one aimed at improving educational practices and has been used as a means to maintain decisions taken at the National Education Council (*Conselho Nacional de Educação* — CNE) and at the Ministry of Education (*Ministério da Educação* — MEC). Thus, the guidelines have been designed and structured based on successful national and international experiences, according to scientific evidences systematized through literature reviews presented in national and international reports. The National Evidence-Based Literacy Report (*Relatório Nacional de Alfabetização Baseada em Evidências* — Renabe), published in April 2021, for example, emerges based on the trends of American, French, British and Brazilian reports.

Evidence-based education would be an innovative initiative if only the nature of the concept and value of evidence were not already predetermined, and the purpose of this approach had not already been defined. Who would oppose advocating for evidences, especially at the current moment when we strongly rely on science due to the COVID-19 pandemic? Nevertheless, it is evident that this approach has its own methodological characteristics based on objective data in spite of qualitative aspects and professional experiences (Hammersley, 2007), which is why it has been deemed insufficient even in the medical area (Eraut, 2007; Peil, 2007). Because the results are achieved by randomized or experimental tests, such evidence is prioritized over the evidence produced by research grounded in interpretative lens which consider the singularities and the meanings of specific contexts, a fact that also adds difficulty to producing systematic reviews of such literature.

The understanding of those who support this approach is that, due to the objective nature of scientific evidence, it would grant an improvement of practices and, consequently, a better position in the international rankings. Therefore, more recently, it has been used by educational administrators from the MEC and the National Education Council (CNE), and has, little by little, been introduced as a scientific solution to problems in basic education and, as a result, also in teacher education. Examples of that are more explicitly present in general education guidelines such as the recent National Literacy Policy (*Política Nacional de Alfabetização*, Brasil, 2019a), launched by the Ministry of Education in February 2019, and in between the lines of the New National Guidelines for the Initial Training of Basic School Teachers — CNE/2019 No. 2 (*Novas Diretrizes Nacionais para a Formação Inicial dos Professores da Escola Básica*, Brasil, 2019b), among other examples.

The launching of the Time to Learn Program (*Programa Tempo de Aprender*), on February 18, 2020, can also be added to this list of measures. This program is an initiative of the MEC aimed at improving, supporting and valuing teachers and school administrators and it is based on national and international scientific evidence. The Science-Based Literacy Course — ABC (*Curso Alfabetização Baseada na Ciência*, Aguiar, 2021), for example, offers training aimed at early childhood and

elementary school teachers. Such perspectives shed light on the fact that, in several foreign countries, known for their high educational standards, the implementation of evidence-based educational research results in classrooms has successfully guided pedagogical and teaching strategies.

To abide to THE MEC's request that teacher education meets the new National Common Curriculum (*Base Nacional Comum Curricular* — BNCC) for basic education, THE CNE appointed, in April 2019, a Bicameral Commission to formulate the National Curriculum Guidelines and the National Common Core to Teacher Education. This commission carried out consultations and public hearings in which different entities participated. On December 20th, 2019, CNE/CP No. 2 Resolution (Brasil, 2019b) was approved and defined the National Curriculum Guidelines for Initial Teacher Education for Basic Education. It also instituted the National Common Core for Initial Teacher Education for Basic Education (BNC-Training). This resolution determined the focus of "sciences for education". This approach, which was already being used by the MEC to implement policies for the teaching of reading and writing, was part of the discussions about the new guidelines for initial teacher education within the CNE.

Even though this perspective is less explicit in CNE/2019 No. 2 Resolution (Brasil, 2019b) than in the documents that regulate the teaching of reading and writing, its presence is evident both in the "reference text" (Brasil, 2019c) that permeated the debate, and in speeches delivered by CNE Chamber of Higher Education counselors in live debates. This shows a clear orientation for the use of scientific evidence, which has worked internationally as ground for decision-making. Also according to the document, the principles of teacher education must be guided by "scientific research that demonstrates evidence of improvement in the quality of training", and must have "pedagogical decisions based on evidence" as pedagogical foundations (CNE/2019, No. 2 Brasil, 2019b).

Both the reference text and the resolution have been widely criticized by research associations and entities such as the National Association for the Training of Education Professionals (Anfope), National Association of Graduate Studies and Research in Education (Anped) and the National Forum of Directors of Faculties and Education Centers (Forumdir). Anped (2019, p. 2), for example, understands the MEC and CNE's perspective regarding teacher education goes "against the concerns expressed by the movement of educators and scientific entities in the area". In other words, despite the historical tradition of academic discussions around teacher education, the efforts to expand the understanding of science in the area and the consensus regarding the insufficiencies of quantitative methods in research in education, the CNE has demonstrated an unyielding posture, which is noticed when it deems the scientific evidence approach as a methodological solution for the problems of teacher education in regard to its adaptation to basic education.

We also highlight that the current initiatives and recommendations of the MEC do not represent an absolute novelty. The Document produced by the Child Literacy Working Group of the Education and Culture Commission (House of the Representatives), whose second edition was published in 2007, stated: "as in other countries, applying knowledge of the cognitive science of reading can bring

important contributions to the review of literacy policies and practices in Brazil" (Brasil, 2007, p. 13). This way, it highlighted the need to make literacy practices more effective by using methods whose results were scientifically proven based on evidence.

Nevertheless, in face of the present policy, it is significant that evidence-based education has gained more space and importance in the latest documents in an unprecedented way. We agree with Hammersley (2007) that it is necessary to acknowledge the importance of teachers being well informed of scientific evidence. However, it should be noted that there are some issues to be clarified, especially because the documents and courses that have been presented have, in general, been prepared by specialists from other areas, such as experimental psychology, applied linguistics, cognitive sciences, neurosciences, and neuropediatrics, and they have methodological understandings and purposes quite different from specialists in the educational area and sometimes, even from specialists from outside the country. The ABC Course, for example, was produced through a partnership of MEC and the Coordination for the Improvement of Higher Education Personnel (Capes) with the University of Porto, the Polytechnic Institute of Porto and the Open University of Portugal. There was sponsored participation of specialists, mostly, from the field of cognitive psychology and neuroscience. According to the president of Capes, it is one of the actions of the federal government to prepare and value reading and writing teachers and there is an investment of more than 6 million reais (Aguiar, 2021).

Given this scenario, we ask: is the evidence-based approach to education adequate for educational processes? Is there a consensus regarding the concept of "scientific evidence" in education research? What kind of epistemological statute supports this understanding of education? On what conception of science is the notion of "scientific evidence" based? Is the paradigmatic focus of this approach sufficient to meet the demands of the area? What would be the ethical goals of such an approach? What conception of education and what educational purposes are being contemplated? What political and ideological interests would underlie the direction given to educational policies by the adoption of this approach? And yet, is the purpose of implementing the approach to contribute to teacher education or, differently, is it to impose some kind of governmental agenda? Our suspicion is that evidence-based education might not serve to qualify the pedagogical process, as might be expected, but rather to constitute a new attempt to oppose to the intentionality of education and to divert the focus from the main problems that affect it.

We adopted the reconstructive hermeneutics of Habermas (1987) as the methodology to ground this work because we consider it an important instrument for evaluating theories and discourses (Devechi and Trevisan, 2010; 2011). This approach helps problematize the scope of the investigated object because it takes into account the way the other is positioned, something usually neglected in the context of public education policies design we are experiencing. The main objective is to deconstruct and reconstruct the problem in more horizontal dialogic bases, taking otherness into account. This methodology makes it possible to reveal the purposes of educational decisions when they are based on a monologic, solipsistic and reductionist language, not going under peer evaluation and agreement. In this

sense, it helps ascertain whether private interests prevail over collective ones by interrogating the need to "overcome epistemological postures and/or reductionist or markedly divergent policies, which distance themselves from a normative view while bringing it closer to the instituted *status quo*" (Devechi and Trevisan, 2010, p. 160). As a guiding objective, this paper aims to understand the meaning and limits of this approach in teacher education.

Bearing in mind that evidence-based education has unilaterally been used in deliberations among the CNE by professionals who, for the most part, are not specialists in the educational area, we decided to give voice to peers in the area (researchers and education scientists) to share their perspectives in relation to its use in the educational guidelines for teacher education. To this end, between March and April 2020, we sent a Google form to 50 education specialists from the main Brazilian universities. The selection criteria was their quantitative participation in the scientific committees of academic journals of the best strata (A1 and A2).

The researchers were asked three questions:

1. Have the New National Curriculum Guidelines for Initial Teacher Education for Basic Education — CNE/2019 No. 2 (Brasil, 2019b), as well as other educational policies that have been implemented in the country, emphasized the approach to education based on scientific evidence? What is your understanding of this?
2. What would be the influence of this change of perspective on Brazilian educational research?
3. What would be the possible implications of the evidence-based education approach in teacher education?

The aim was to voice the silences in the area regarding the CNE's option for such an approach and to consider whether it achieves the goals we have historically set for this training, that is, a training which is not only technical, but reflective, critical, non-reductionist, and committed to the human and the social. We agree with the understanding of Anped (2019) that the teacher is "a person who has an impact on the lives of others, who makes a difference in the lives of children, young people and adults, which is something possible precisely because the educational practice as a social practice is not homogeneous, but contextual, plural and diverse". We obtained feedback from 25 experts, from which we identified arguments in favor and against such an approach, which will be presented and discussed below. The respondents are education researchers from important Brazilian universities, and are recognized in the country for the impact of their scientific production (number of citations and h-index).

THE PERSPECTIVE OF EDUCATION SPECIALISTS REGARDING EVIDENCE-BASED EDUCATION IN TEACHER EDUCATION

From a hermeneutic interpretation of the answers to the questionnaires, we highlighted the main understandings of education specialists about the evidence-based education approach to teacher education, which revealed the under-

standing about the subject among our academic peers. From the 25 responses, four were in favor of the evidence-based education approach in teacher training, while the others pointed to arguments against the use of such an approach in teacher education. In summary, the favorable responses indicated the approach as a way of:

- improving qualification in teacher education and;
- offering a greater appreciation of the science project in education.

As these two elements complement each other, we will see the understandings of the four teachers favorable to it below.

ARGUMENTS IN FAVOR OF AN EVIDENCE-BASED APPROACH IN TEACHER EDUCATION

Interviewee 16 emphasizes the importance of valuing scientific evidence in the area and the need for teachers to be "duly qualified regarding the field of science. To promote Brazilian research, the appreciation of science is essential, and this appreciation has a lot to do with the learning developed in basic education and also in higher education" (Interviewee 16). Interviewee 15 asks: what "a higher education institution that is not guided by scientific methods would be. If I seek the answer to a problem, it will not be common sense that will provide pertinent answers". To this end, this interviewee argues that "the method to verify a study must be rigorous and sustained by theory". For him, "one of the flaws in teacher education is the absence of statistics as a basis for supporting quantitative methods". For interviewee 15, there are currently "very interesting studies from neurology that are very useful for understanding certain educational learning phenomena", for example. These statements point to the importance of science for teacher education, identifying the quantitative method as a resource for the production of rigorous knowledge in the area. It is worth noting that the matter of rigor or the epistemological status of the field of education is quite complex and can be considered as being in permanent dispute. In this regard, Charlot (2006, p. 1) opportunely asks himself: "Would it be possible to define and construct a specific discipline, named education or education sciences?". As the author reminds us, the bet on the existence of a specific discipline in this field opens the way to various types of discourses on education, such as the spontaneous, the practical, the anti-pedagogists, the pedagogy one, the human sciences one, the activists' one and that of international institutions.

Interviewee 21, on the other hand, considers that "scientific evidence is important to the extent that the research results are converted into possible pedagogical practices on a large scale. Evidence can foster, on the one hand, better pedagogical practices and, on the other, it indicates gaps and questions that need to be deepened by further research. Scientific evidence requires more rigorous planning of training processes in order to equip teaching professionals with tools that allow them to face both the challenges of education and student learning with greater confidence". Such understanding points to the positive impacts of scientific evidence on pedagogical practice as well as to the need to prepare teachers for its proper use. The issue, then, would be clarifying what is

meant by better quality "pedagogical practices" based on scientific evidence and the presumed identification of education with learning. The evidence model as well as the responses of interviewees 15 and 21 are closely linked to this latter discourse identified by Charlot, which — today, relying also on the cognitive sciences — presupposes that all innovation is progress.

Interviewee 19 says that "to be grounded on evidence provided by science is the best way to demand an effective research practice in the educational field, which is understood as the construction of knowledge". Nevertheless, he is also concerned with "all the difficulty we still have to establish a consistent scientific standard for education" and states that, therefore, we cannot "abandon the goal of establishing a research tradition in this field. This implies building knowledge in a rigorous, systematic, and epistemologically grounded way. This updates and reinforces the need and pursuit for scientific grounding, directly and incisively stimulating the development of research in the field and its consolidation". As he advocates for a scientific evidence approach, the interviewee seems to point to a broader understanding of scientific evidence when he defines research in the field as the construction of knowledge. In other words, he supports scientific rigor, but does not seem to reduce the field to the quantitative method. This concern with rigor is important, especially considering the nature of educational research and the breadth, ambiguities, fragmentation, and the consequent uniqueness of the challenges in the field. One must be careful not to rush through diagnosing weaknesses of the field influenced by a reductionist perspective of both the field and human experience, such as offered by an epistemological model of the cognitive sciences that, even though it has a lot to contribute, is evidently far from embracing education as a whole.

As evidenced, there are two perspectives based on the understanding of a more objective, rigorous, statistical science as a way of improving teacher education and pedagogical practice, and one perspective oriented towards defending scientific evidence in the broadest sense and sensitive to the needs of the area.

ARGUMENTS AGAINST THE EVIDENCE-BASED APPROACH IN TEACHER EDUCATION

Because the positions against the evidence-based approach represent a larger group, we will present them according to group themes, since these were the gaps and silences mostly emphasized by the interviewees. We mapped four main dimensions from the interviews:

1. scientific reductionism of the approach;
2. no consensus on the nature of "evidence" in education research;
3. evidence-based education as an impoverishment of teacher education; and
4. evidence-based education as a technocratic and managerial discourse.

Scientific reductionism of the approach

Most respondents understand that such an approach has a shallow understanding of science which does not sufficiently address the needs of education and

teacher education. In no way do they deny the importance of evidence or of a certain rigor for the validation of scientificity in education, but they emphasize the need to be clear about the epistemological bias underlying the approach. They defend that evidence and science are not reduced to the quantitative method. Interviewee 3, for example, agrees with the search for "a more scientific, more rational mentality", but warns that it is not just about "any type of scientism or unified thinking about what science would be".

For the interviewees, the complexity of educational knowledge requires knowledge with diversified methodologies, that can converse with philosophy, art and literature, because, in addition to objective data, the field demands attitudes, intentions and positions that cannot be reached only by quantitative methods. The focus on competences, for example, which is highly emphasized in teacher education guidelines, highlights a narrow and limited way of understanding and carrying out the training process. Interviewee 9 adds that the approach "is something very limited and risky. The education of the arts, philosophy, literature should have a more significant voice that is equal to that of science". For him, it is more of an approach that, like positivism, empiricism and pragmatism, reduces and encloses the differences in themselves.

For interviewee 13, "the notion of scientific evidence of the current policy resembles that of the No Child Left Behind program (which has been critically analyzed by Zhao in his 2018 book "What works may hurt — Side effects in education"), especially in the case of "reading" instruction, which, not by chance, came back into the field (a phonic method or direct lowercase and uppercase instruction)".[2] Zhao contrasts this perspective with what happens in the medical field, where evidence is never solely considered: in the name of evidence, side effects and the whole (interdisciplinary) issue must be taken into account — in the United States, the results show enormous failure, which will be repeated here". He admits that, although the left may have exaggerated in the use of open methods, also because the failure has not changed (for example, the National Pact for Literacy at the Right Age — Pnaic did not go beyond ensuring that, after three years in elementary school, not even half are literate; in Maranhão, just over 20%). In part, it is because the "reading teacher" remains the same, the school is the same, the pedagogy is the same. He says it is interesting to think that the BNCC talks about "school recreation", a very strange term that falls from the sky, like bad conscience. He knows that, if we follow minimal evidence, schools as they are will not stand. In short, we can say that, for the interviewee, for our context, this policy is inappropriate to deal with the problems of elementary school, as it is a new cultural invasion.

For interviewee 17, "any conduction of teacher education from the perspective of science alone is limiting. Not in the sense of devaluing its important contributions, but because of the partiality of its approach." She considers that, in

2 The No Child Left Behind (NCLB) Act of 2001 was a bill passed by the American Congress based precisely on the premise that the experiences of the best measurable results should guide the choices made in the United States in the field of education.

general, the sciences do not discuss what it is to be human, values, beliefs, knowledge, ethics, etc. And that they depart from a safe and stable categorical ground about the human being to develop their observations. However, she adds that no insufficiency of rationalism is discussed by science. Therefore, she considers it necessary to understand the paradigms certain evidences fall within. The sciences generate important results and many of them have forced philosophy itself into revisions (as for the influence of science to review metaphysics). But they cannot disregard the work of philosophy (especially hermeneutics) to foster understanding.

Also according to interviewee 17,

> the reverse of the research itself, that is, to understand how a given historical-cultural context directs our gaze and the construction of the research object, what kind of preconceptions (not in an ethical sense, but in that of cognitive structures) guide the interviewer's work, which implications structure data search and which expectations guide the investigative work.

For the interviewee, in education, it is necessary to consider the inside outs of "traditional" research that is satisfied with what is shown in the phenomenon, and this is only achievable through the adoption of theoretical and interpretive perspectives. In this sense, it can be argued that, in order to resist the theoretical weaknesses and dogmatism connected to the predominance of empiricism which so often affects the area, educational research cannot recede below the level already reached by post-empiricist epistemologies and by philosophical hermeneutics. Indeed, when Popper (1982) refuted the principle of induction as a criterion of scientificity supported by verificationism, he had already clearly indicated the serious limits of empiricism and defended a hypothetical, procedural and fallible character of all scientific work. In a different sense, but also very close to this perspective, when Habermas (1988, p. 282) presents the points of view under which hermeneutics gains relevance to science and how it interprets results, he reminds us that the very choice "of the theoretical framework and basic theoretical predicates need to conform to a pre-scientific pre-understanding of the object realm itself".

Specifically regarding educational research, interviewee 20 argues that such an approach may incur in excessively quantitative work, statistics, placing qualitative, analytical, critical research in the background. This perspective is complemented by the opinion of interviewee 22, who says: "we have to look carefully at which evidence is being pointed out as important and the research that supports it". It all suggests that such an approach "is part of the current emphasis on 'accountability' in education, which, supposedly, seeks 'objective' criteria to evaluate teaching and learning."

The understanding of the interviewees is that an evidence-based approach to education brings a misconception about the nature of educational research and an overconfidence that such a research model could guarantee that the best is being done. This refers to both providing information about "what works" and to documenting whether professionals are actually following the "best practices", and, can, therefore, be open to public criticism. In their view, we once again run the risk of reducing educational research to the instrumental and reductionist model of science.

There is no consensus on the nature of "evidence" in education research

According to Habermas (1986; 1987), in the modern project, the tendency to reduce discourse to the scope of scientism predominated, that is, under the false belief in the rationality of progress as the only way to solve problems. As a result, discourses from the living world were gradually colonized by a neutral rationality, culminating in the fact that: "these types of actions replace validity claims with power claims" (Riviera, 1995, p. 27). This perspective helps understand the evidence-based education project at that moment, as demonstrated by interviewee 5 straightforwardly questioning: "what evidence, if science is not neutral?". For her, educational research has always sought evidence, but she calls attention to the need to analyze the nature and usefulness of the evidence in question. Interviewee 11 also asks: "what kind of evidence are we talking about?" In this sense, he understands that, in order to escape the trap of evidences that "lie", it would be necessary to elevate the matter of scientific evidence in the area to the level or status of an epistemological, theoretical-methodological matter. For that, he considers that teacher education should move in two directions: to translate the knowledge produced and that makes up the cultural heritage of humanity, which is not always understood, and to attack the naturalized and naturalizing beliefs of information (common sense) elevated to the status of knowledge.

Interviewee 8 also shares the same concern: "it is important to discuss what we understand by scientific evidence". For him, the nature of the existing evidence in this approach encompasses the idea of results-based evaluation, reducing teacher education — the teacher's profile and task — to the measurement standards that come from the physical-mathematical field, which is very close to the Programme for International Student Assessment — Pisa. He emphasizes that an adequate teacher education policy requires asking what is left out of these "measurement standards". In his view, what this approach disregards is perhaps what is most important to human development educational process. Asking about "who the human being is" leads to understanding many aspects of human formation that escape scientific evidences, especially those resulting from the alliance between didactics and psychometry". He suggests that evidence should be considered in a wider way so it communicates with the humanities and social sciences, because only then it will be possible to build and implement good public educational policies.

Interviewee 4 points to the same direction: "it is not so obvious that what is 'evident' is exactly what is desirable because what is desirable implies value attribution". For him, the notion of scientific evidence can hide fundamental dimensions of education that are not measurable. For example, "if an experiment shows that students learning mathematics with the help of a software end up learning faster than those who study mathematics with a teacher, would it be evident that we should dismiss teachers and replace them with softwares?" Or even, "if it is scientific evidence that a militarized school, with vertical and authoritarian relationships, ends up having better results in evaluation exams, would it be desirable for all schools to have this format?" For the author, it is clear that evidence in education cannot be reached this way because the area, dependent on intentionality, inquires

"to educate for what? To educate for what world? To educate to form what kind of person?" If education does not face these issues, it will only corroborate meanings established in non-discursive spheres, that is, inherent to the very functioning of the economy, of power relations.

Interviewee 7 points in the same direction: "it is necessary to investigate and discuss what is meant by evidence". He follows Bachelard's understanding when he says that epistemological vigilance is necessary to identify the problems to be faced in the formation of the researcher's spirit and to avoid the mistake of falling into the totalitarianism of ideas and the instrumentalization of evidence. He recalls that Popper points in the same direction when he argues that an investigation process should be conducted by proposing problems that are always theoretically informed, which means that the evidence is not given, but theoretically constructed. That is, the posing of a problem of any nature is always informed by a theory, from a horizon of expectations from which the subject assigns meaning to his experiences, actions, observations and result analysis.

Considering this author's understanding, good teacher education requires good theoretical grounding. For this reason, evidence-based education, for him, becomes empty and superficial when it mistakes science for empiricism, because it is a theoretical/conceptual look at the world above all. This is precisely due to the fact that one of the fundamental characteristics of science is, according to Popper, its necessary effort to always advance seeking to improve its explanations. As Popper (1982, p. 305) reminds us, "science is not a system of certain or well-established statements, nor is it a system that steadily advances towards an end (...) it can never claim to have attained truth". There is also another factor, complementary to this one. For interviewee 13, "research in education is not deterministic", as it demands other pedagogical skills, of a socio-emotional nature, which are much more difficult to measure.

Interviewee 9 asks once again: "what is evidence? Why educate in one direction and not in another?" For him, no evidence is able to answer these questions. Interviewee 18 says that research in education is far from being evident in a measurable sense, "not only because of ideological mediations, but also because of the difficulty in reaching consensus on research quality indicators and the uncertain and incomplete nature of knowledge" in teacher education. In her opinion, we need to be very careful when talking about evidence in teacher education, because what is evidence in a certain context may be different in another. Thus, she understands that

> […] taking evidence as a reference for teacher education is, at the very least, a trap that consists of reducing learning to what can be measured, to specialization in teaching to its effectiveness, which is conceived as added value, and the value of education to its instrumentality, because the evidence, the systematic reviews, and the meta-analysis constitute basic assumptions of evidence-based research.

Interviewee 25 agrees when he states that "evidence-based education does not differ from what the educational field already does. The question to be consid-

ered is to think: what does evidence mean for the field of educational sciences?". He emphasizes that the focus of such an approach in educational guidelines may have two consequences:

1. the resistance from professionals in the field because they did not participate in the construction of the terms of the guidelines;
2. the possibility of improving the field by clarifying what it is meant by evidence.

In other words, it is up to those involved in teacher education to take advantage of the discussions around evidence and improve the sciences of education as well as decide whether or not to put this perspective into practice.

Interviewee 20 shares this point of view when he points out that the search for scientific explanations in the area is not only necessary, but must also support the planning, development and evaluation of policies and practices developed by the educational system. Nevertheless, this search would need to be adequate to the complexity that characterizes the studies. He understands that education cannot be reduced to science in the traditional sense. However, he argues that the "non-definition of the nature of the science of education means that pedagogical concepts and practices are scattered, some are innovative and creative, but, for the most part, they are conservative and ineffective".

In summary, we can say that there is an understanding among the interviewees that there are different perspectives regarding the nature of evidence in education research considering the approach adopted by the CNE. Also, it might be opportune to the area to take advantage of the moment to face the discussion of what the concept of evidence in education and teacher education would be. As interviewee 14 says, the opposition to such a tendency can

> […] represent an important stimulus for Pedagogy to assume its commitment — non-transferable — to a science whose research is capable of providing the necessary foundations for the formation processes of social beings in the making, following the way of human emancipation.

Evidence-based education as an impoverishment of teacher training

For interviewee 1, the approach offers "another false belief of reducibility, reasoning and simplification" for teacher education. He admits that there are criticisms about research in education for its excess of empiricism, for the lack of theorization, for the difficulty in handling certain methods and procedures for the field of teaching and learning; in short, for failing in its objectivity and as science. However, he argues that "there are other ethical, subjective problems related to the field which are little addressed, almost ignored and, purposely, ignored for various reasons". For him, the "conception of scientific evidence-based education seems to ignore all of this to advertise itself as an absolutely anachronistic novelty, in clear disregard for the history of Brazilian education". He understands that, if the idea of evidence was adequate to the area, it could help challenge common sense, an often times

fundamentalist take, even within what has been called pluralism, and subside better empirically, theoretically and conceptually grounded practices. Nevertheless, he warns that depending on how it is presented, "it can generate another life vest, as fundamentalist as that of common sense". It might bring apparent peace together with a less reflective, supposedly more technical paradigm capable of keeping "the dynamics of Brazilian education, its conflicts and inequalities just intact".

Interviewee 4 recognizes that scientific evidence can be somehow useful, as long as it is subsidiary in educational research. Such quantitative data can be considered in the research, but "they should never result in direct and immediate actions based on what they reveal, on their findings", because education is constituted by an "inter-generational dialogue that will always be conditioned by the living and dynamic condition of the poles of this dialogue, the educators and the students". He, therefore, understands that educating is not summed up to something that "works", that can be predicted in advance. Such an approach, in this sense, stands as another trend that intends to mitigate all the evils in the field of education. For interviewee 8, it is about a narrowing of horizons to think about and design the education of new generations. Its effects can "generate a process of semi-formation or even deformation", accentuating the technical know-how in detriment of general human formation as a result.

Interviewee 12 illustrates his concern by referring to one of the great defenders of the approach in Brazil, the Alpha and Beta Institute (*Instituto Alfa e Beta)*, which has supported the idea that only the use of scientific knowledge about what works in education can contribute to improving the quality of educational policies and practices. In a nutshell, the interviewee states that to understand the weaknesses of the evidence-based approach we would have to understand its objectives regarding the (public) purpose of education, its conception of education, how it conceives the teaching-learning and theory-practice relationships, what the teacher's role implied by it is, what the understanding around teacher education is, if we know the real conditions teachers have to face to develop their pedagogical practice, which perspective on educational research is in place, among other aspects.

Interviewee 17, on the other hand, emphasizes that the approach

> […] might influence by increasingly stimulating the predominance of the scientificist view of education, and excessively valuing the results of international tests, standardizing teaching, impeding teacher education to come up with creative answers and, above all, disregarding the richness of the human encounter between teacher and student, which is impossible to be apprehended by scientific evidence.

Also, it might devalue areas such as the arts and philosophy and other rationalities (such as poetics, aesthetics, ethics) that enable some contact with human experiences. In other words, such an approach will impoverish the pedagogical experience and discourage reflective thinking. Interviewee 19 adds that it is necessary to train teachers by providing them with opportunities to experience the knowledge construction process, not finished products that "work".

Interviewee 20 understands that research in education cannot merely rely on scientific evidence as it has been done. His understanding is that objective evidence can help investigations, but we cannot limit ourselves to them at the risk of simplifying the research to obtaining scores and quantifications. "Teacher education can and should be based on evidence, as long as it is not reduced to statistical data and quantification, but is based on their experiences and practices".

Interviewee 22 points out that he "would be very concerned about a training course based on supposedly scientific evidence of a questionable or unique theoretical/philosophical perspective". In other words, it would not be a healthy epistemological approach, for two basic reasons:

1. we are never sure that a science or a scientific approach is the best and all of them have to be contested at all times;
2. he does not agree with scientism, which says that everything that is important in education, including the contents to be taught, as well as teaching methods, etc., can be provided by the sciences.

Last, he concludes by saying that there are other areas of study (especially in the humanities) that can discover or show important aspects of reality and of teaching and learning that science cannot see or analyze.

Interviewee 23 does agree that, if there is coherent and consistent work to establish a conceptual review of the sciences that have dealt with education in order to achieve a science of education, then the evidence produced by this new science will be relevant in teacher education. However, it seems to him that this will not happen soon, if ever. Therefore, he expands the range of understanding of what is conceived as "science", stating that the most important thing is "that the various sciences that deal with education are taught as sciences, that is, the future teacher learns to think and act as a scientist, as a sociologist, a psychologist, an anthropologist, as well as to learn the main problems of the philosophy of sciences". In reference to other fields of knowledge, he adds that one of these problems is the validation of what is said to be evidence in the sciences, which is not a particularity of the sciences, as it is found in the field of law, especially in criminal law. The control over the cognitive instruments necessary to validate something presented as evident are the same in all areas of knowledge and in social life. Finally, he argues that university students need to dominate these instruments, especially teachers to be, because it is through them that we are able to apprehend lies, falsehoods and fallacies.

Interviewee 18 emphasizes that it is important to go beyond the proposal in question, and states that she really likes to think of teacher education as being "a formative experience" that is much broader than being attached to scientific evidence". Interviewee 14, on the other hand, understands that if Pedagogy accepts the assumptions and conclusions of this proposal without further ado, it "will reduce its epistemological status, will be dismantled as a science and will accept the role of a specialized technique". For him, the result would be "to remove the scientific character from educational research, transforming it into a simple search for desirable practices".

Such understandings can be summarized by the idea that, in education and, therefore, also in teacher education, the interpretation of the social and the scientific should go hand in hand and not in opposition. Reductionist epistemological conceptions and narrow teaching and learning considerations have historically tended to lead us to forms of school organization that have turned into mechanistic and discriminatory practices against children, which segregate and exclude them from the pedagogical process because of the filters of "normality" adopted.

Education by evidence as a technocratic and managerial discourse

Another gap in the evidence-based education proposal, as pointed out by the interviewees, is an adherence to technocratic and managerial discourses that permeate the systemic world, concerned with material reproduction and strategic power. According to Habermas (1987), with the advent of modern rationality, this discourse left its own niches of action (economic and administrative systems, such as large banks, public and private companies, for example) and invaded the world of life and the social, causing social pathologies. Interviewee 12, for example, says that it is "evident that education should be guided by scientific studies. However, the discourse currently in vogue in the spheres of formulation of educational policies in Brazil uses scientific evidence to avoid issues that are essential to the educational field". He understands it as "one of the hues of the technocratic, privatist and managerial discourse in vogue". The limitations, anachronisms and narrowed understanding of the educational field ground such policies and are initiatives characteristic of the state of exception that we are experiencing in Brazil. He moves on to analyze Resolution CNE/2019 No. 2 (Brasil, 2019b), which, according to him, recalls the logic and certain elements present in Bill 5692/71, from the dictatorship period in Brazil. Finally, he also mentions that there is the privatist side of this ideology of evidence-based education. It is sold by private sector institutions, such as Lemann and Ayrton Senna foundations, among others. In other words, by using a reductionist type of scientism — it represents the interests of the private sphere in directing educational policies in its various spheres, hiding, among other things, the commodification of education. In short, he claims that this is nothing more than a new way (trend) of directing public policies and selling educational products that colonize public education.

For interviewee 24, "evidence-based education" is just one of the multiple competencies highlighted by CNE/2019 No. 2 (Brasil, 2019b), more specifically found in the Appendix of the document. The term "competence" has a specific meaning within the proposal of the "new national curriculum guidelines", in that it is a concept directly linked to training primarily directed to the market, therefore, under the auspices of neoliberal ideology. Under this perspective, the interviewee cites the definition presented by Dardot and Laval (2016, p. 7) in the book "The New Way of the World": "neoliberalism is not just an ideology, but a type of economic policy, a normative system that has expanded its influence to the whole world, extending the logic of capital to all social relations and spheres of life". Education has become one of their priorities, particularly in the last ten years. And, among the members of CNE, the advocates of public-private partnerships, of

business reformers, are gradually gaining presence and prominence. The interviewee remarks that the category "quality of education" was progressively replaced by the term "competence", which is extensively used in the document: the Appendix of CNE/2019 No. 2 (Brasil, 2019b) is proof of the strong presence of this term, both in the "general teaching competences" and in the multiple "specific competences" related to "professional knowledge", "professional practice", "professional engagement". In other words, even though the 30 articles of CNE/2019 No. 2 (Brasil, 2019b) apparently share a glimpse of critical, democratic, progressive guidelines, the Appendix, however, which summarizes the proposal and directs it to practice, is filled and illustrated with the "competence" for the market.

For the interviewee, the methodological orientation of an education based on scientific evidence, with specific support from new digital and other technologies, is clearly expressed in the body of CNE/2019 No. 2 (Brasil, 2019b) and, above all, in its Appendix. Most certainly, educational research that moves towards the aforementioned resolution will have more space and support from research agencies, as they will be more directly focused on the interests of the capital, the market and the expansion of neoliberal ideology. Even though it might create obstacles, this does not prevent researchers who criticize the system and the articulation of education with public-private partnerships from carrying out investigations in the areas of education, health and other sectors of public and social life. What might represent a frisk of hope is the fact that, in the academic field, more specifically in the areas of human, social and health sciences, but not restricted to them, critical and democratic intellectuals predominate among researchers and *ad hoc* consultants. Nevertheless, one should not be deceived and believe that the system will stop interfering in the choice of its consultants. That is, before asserting the possible influence of such an approach to education on the educational research in the country, we need to critically consider the role of this interpretation which is present in the resolution as an expression of a public policy.

If we simply analyze the dimension of the scientific evidence-based approach in teacher education, it is clear that there is a double perspective. On the one hand, the contribution of research and science to the search and discovery of knowledge is undeniable, particularly after the modern era, and that was important for humanity throughout its path, and journey. On the other hand, interviewee 24 recalls that history tells us how capitalism operates as the dominant mode of production, and how the main scientific discoveries and technological enterprises were at the service of capital rather than of humanity, and of domination and destruction rather than the emancipation of man. The interviewee presents a quote from Adorno and Horkheimer (1985, p. 48), from the *Dialectic of Enlightenment*, that expresses this reality: "On the way from mythology to logistics, thought has lost the element of reflection on itself, and machinery mutilates people today, even if it also feeds them". Therefore, he thinks that the critical and reflective perspective should guide the training activities of teachers, so that they can contribute to "scientific evidence" being tested, questioned, and supported when they are truly serving the development of their learners, just as Kant, at the end of the 18th century, indicated.

Interviewee 7 maintains a similar understanding, and reiterates that

> […] training is something too serious and we should not believe that the market can regulate anything. Good training takes time, requires investment, requires ethical attitudes, demands rigor, presupposes adequate infrastructural conditions, qualified teaching staff, a good library, and good interaction.

Finally, for the interviewees, everything leads to believing that this is a perspective imposed by a governmental agenda focused on entrepreneurship, the control of teachers and professional supervision in regard to success in international rankings and in economic agendas. The lack of a more consolidated perspective is certainly not interesting to policymakers because it complicates monitoring professional performance and, therefore, holding the public sector accountable.

We notice that communicative action is being withheld in this proposal to benefit a strategic and instrumental action, which is characteristic of the systemic scope. The imperatives of the technocrats are present in these actions, either through initiatives that come from the mercantilist private sector, or through the imposition of international rankings that end up enforcing their agenda loaded with privatist and neutral ideology, under the excuse of efficiency and performance: "It is a rationality of action according to which agents excuse themselves from being publicly held accountable for their intentions and ways of doing, and do not pay attention to the possible consequences of their actions" (Riveira, 1995, p. 20).

CONCLUDING NOTES

This paper sought to understand the process through which the evidence-based education approach in teacher education in Brazil is implemented. It took into account a hermeneutic analysis of 25 questionnaire responses of education specialists. Although there are favorable arguments from four interviewees, 21 participants had an unfavorable position to the approach. The following aspects stood out in their general statements: the nature of the evidences, the existence of different types of evidences in research in education, the negative consequences of the approach in teacher education and the government agenda present in the implementation of the approach.

As we have seen, evidence-based education represents an attempt to translate the same model of evidence-based medicine into the national educational context, which means "integrating individual teaching and learning experience with the best available external evidence from systematic research" (Davies, 1999, p. 117). On the one hand, the supporters of such an initiative understand that it is possible to transfer experiences that "work" from other countries to our context. These experiences are mapped through systematic literature reviews, and disregard both the different realities and their socio-political and cultural aspects and qualitative research that is not compatible with literature systematization. On the other hand, critics of such an approach argue that it goes against the pedagogical tradition with regard to the commitment to education. The concept of evidence is considered a trap to evaluate the training of education professionals in relation to the ethical-moral and social commitment to "human educability" (Dalbosco, 2019).

It indicates that the approach is a way of evading the problem of funding in education, the critical training of teachers and the improvement of the living conditions of populations, all of which fall under the rhetorical justification of mystification under the cult of "scientific evidence". These are presented under the guise of a neutral discourse, when in fact they serve the interests of the system (Habermas, 1986; 1987; Riveira, 1995), allied to privatist, managerial and technocratic projects. Therefore, it emerges as a way of managing education and monitoring the performance of teachers in favor of the economic agenda, as the interviewees pointed out. Indeed, as Ball (2005, p. 544) points out, "managerialism plays an important role in destroying the ethical-professional systems that prevailed in schools, causing their replacement by competitive business systems".

In this paper we sought to better understand the meaning of the evidence-based education approach in teacher education by providing representatives of the community of Brazilian education researchers with opportunities to support or confront this perspective. It is a contribution that aims to fill a gap left by the unidirectional role of the CNE in decision-making, a posture which has disregarded contradiction and the position of specialists in the area, even though they have participated in some of the debates within the scope of the Council. By making room for this discussion, the paper unveils a project which has deviated from the purposes of teacher education as supported at the universities.

As we have seen, the researchers interviewed reiterate that the legitimacy of teacher education comprises intentionality, adequate understanding of the singularities of the educational field, an ethical posture, context and human formation that is not constructed, nor does it spring from empirical facts. The understanding of specialists, for the most part, points to a perspective of evidence quite different from that in the field of education, which cannot, due to its specific characteristics, be confined to the scope of quantitative, objective and experimental methods, much less to randomization, as thoroughly discussed in the area.

In face of this analysis, with regard to its political-ideological nature, it is an approach with economic interests, and has been presented as a solution for the problems of basic education, as if there were "technical solutions, based on facts, to problems that necessarily involve value judgments" (Hammersley, 2005, p. 94). Regarded by supporters as a successful educational project, considering the international rankings, it uses the label of science as a maneuver to depoliticize education at the same time that it discredits research and experiences in the field and controls the performance of teachers. In this regard, Flickinger (2019) warns that the prospect of ranking countries prioritizes economic needs over social demands after all.

As stated by most of the interviewees, the objective of teacher education is not just to allow learning to take place. It must be committed to a broader educational project that allows reflective, critical, contextualized, and individualized attitudes as well as decision-making according to the needs of each context. Teachers must be able to lead the education of future generations both towards professional practice and reflective action aimed at public needs. This requires training beyond evidence that "works" according to predetermined political understandings. In summary, education not only requires facts, but also responsible intentions. In this sense,

Biesta (2007, p. 11) says that "the only conclusion so far is that education should be understood as a moral practice, not a causal one, which means that, when all is said and done, professional opinions in education are value judgements, and not simply technical judgments".

We agree with D'Agnese (2013, p. 76) that evidence-based approaches end up "showing how such understandings are not only dangerous on a political-ideological level, but also shallow, precisely from a scientific point of view, and highly reductive regarding the role and functions of education". Therefore, despite the appealing defense of scientificity, such an approach would offer misleading solutions to teacher education, due to its clear deviation from real educational problems.

Finally, what an evidence-based approach hides when it presents itself as a possible (scientific) solution to educational problems could also be considered. In addition, criticism around the evidence model and the resistance to the technocratic and managerial approach underlying it also need to be further refined. Fundamentally, however, recovering the hermeneutic rationality (and art) of education, which is essentially dialogic, is still necessary, under the penalty of misrepresenting its epistemological statute (Charlot, 2006), which is neither uniform nor closed, but open. Therefore, we echo the warnings around reductionisms, such as mistaking education for learning and a cognitive focus on it (Biesta, 2007). The idea of generalizable knowledge favors the control of teacher education, considering how easy it might be to measure performance and to disregard opinions outside of what was planned. Therefore, the current trend seems to be to move away from the competency paradigm in favor of the evidence paradigm because competences are difficult to measure when compared to evidences. Our diagnosis is that, regarding teacher education, we have already distanced from theory (Moraes, 2001) and, now, we are retreating from practice.

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ABOUT THE AUTHORS

Catia Piccolo Viero Devechi has a doctorate in Education from the Universidade Federal de Santa Catarina (UFSC). She is a professor at the Universidade de Brasília (UnB).
E-mail: catiaviero@gmail.com

Amarildo Luiz Trevisan has a doctorate in Education from the Universidade Federal do Rio Grande do Sul (UFRGS). He is a professor at the Universidade Federal de Santa Maria (UFSM).
E-mail: amarildo1.trevisan@gmail.com

Angelo Vitório Cenci has a doctorate in Filosophy from the Universidade Estadual de Campinas (Unicamp). He is a professor at the Universidade de Passo Fundo (UPF).
E-mail: angelo@upf.br

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