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Knowledge, Understanding, and Competencies in Teaching Formation and Practice

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ABSTRACT

This paper presents concepts and beliefs that support teaching actions, with their definitions and classifications regarding the knowledge, understanding, and competencies common to teacher education and practice. It is characterized as an exploratory study focused on the analysis and literature review in qualitative research. The research resulted in the identification of 40 studies, from which 12 investigations conducted between the years 1980 and 2020 were selected. It brings additional understanding about teacher knowledge and understanding and their nomenclature, and differentiates the ideas of authors who address the topic. This investigative arrangement favors the understanding that consistent teaching action must be supported by procedures, techniques, practices, and professional experiences, and brings to itself an identity embodiment of teaching know-how exercised and recognized on concepts and attitudes, understanding, and procedural competencies for the exercise of educational action.

KEYWORDS: Teaching knowledge. Pedagogical action knowledge. Craft of knowledge. Teaching identity.

1 INTRODUCTION

In investigations into the teacher education process, the existence of multiple forms of knowledge associated with the act of teaching is undeniable. It is essential that this array of knowledge, understanding, and competencies held by a teacher not be trivially reduced to scientific knowledge about a particular science or discipline they teach, nor solely to the techniques or strategies employed to enhance teaching and learning processes. Teaching demands from the teacher a set of skills that go beyond aptitude, volition, intuition, culture, personal knowledge, or innate talent.

Teaching is an act of liberation and (re)construction of individuals (FREIRE, 2011) and calls for a craft of knowledge (GAUTHIER *et al.*, 1998). It requires competent training, the ability to transform acquired information into knowledge, to combine theory and practice, to reflect on oneself, one's actions, and intentions, with the aim of bringing about significant changes in the lives of others and in their historicity.

Teaching is not a profession devoid of its own knowledge, nor is it a profession without knowledge (TARDIF, 2006). Due to the essence and variety of knowledge it requires, the act of teaching simultaneously validates and provides meanings to the teacher about the knowledge of their finely honed role in the school environment. In this environment, knowledge is refined, shaped, honed, reconstructed, and given meaning in an unusual pedagogical context, such that the teaching and educational work of the teacher is organized and structured in action knowledge, teaching strategies, pedagogical perspectives, and work habits, shaping the professional knowledge of the teaching profession, designated by Tardif (2006) as the knowledge of professional experience.

In this sense, this research seeks to achieve a clear and cohesive definition of the meaning and importance of teacher knowledge as attitudinal and procedural amalgams derived from subjects, curricula, and active teaching profession (SHULMAN, 1987; GRIMMETT; ERICKSON, 1988; VAN DER MAREN, 1995; TARDIF, 2006) related to the strategies employed by teachers in the teaching environment. In light of the study, I assert that knowledge in this research is nothing but a collection of educational actions, a set of practices and behaviors capable of shaping future skills based on the experiences that the teacher may also bring with them.

Knowledge aims to carry out pedagogical procedures related to the transmission and didactic transposition of understanding, and does not necessarily need to be associated with the production of scientific/academic knowledge (TARDIF, 2006) produced in universities. When knowledge is taught by teachers in school, it is produced and legitimized in academia, and does not require social, institutional, and epistemological ties (TARDIF, 2006) between teachers who produce knowledge and professional teachers who transmit and replicate it in the classroom.

The research conducted is part of a doctoral investigation defended in 2023 in the Graduate Program in Science and Mathematics Education of the Northeastern Education Network (RENOEN) at the Federal University of Ceará - UFC, aiming to point out understandings, definitions, and insights delineated by a group of authors studying the knowledge, understanding, and competencies necessary for

the redefinition of teachers' actions in order to find paths and pedagogical practices based on knowledge favorable to training in Scientific and Technological Vocational Education - EPCT.

The article is divided into 5 (five) chapters and presents the introduction and hypothesis that generated the research, the construction of the theoretical framework, the methods employed in obtaining the results, the results achieved with their dissonances and resonances among the analyzed research, and finally the reflections for the propositional delineation of teaching know-how based on the understanding of teacher knowledge and understanding.

2 TEACHER KNOW-HOW IN PROFESSIONAL PRACTICE

As a construct of socio-cultural origin (MIZUKAMI, 2006; TARDIF, 2006; FREIRE, 2011) and specific to various human professions, knowledge in the context of the teaching profession admits and avows in this research a specific definition to differentiate it from what is conceived as knowledge and competence. But what are teacher knowledge, understanding, and competencies?

Many authors researching the theme of teacher knowledge have particular but analogous understandings of what the term knowledge means. They generally agree that teachers, in the exercise of their practice, reflection, and praxis, acquire knowledge through actions and understandings about educational action in the classroom (GRIMMETT; ERICKSON, 1988; VAN DER MAREN, 1995; SAVIANI, 1996; GAUTHIER *et al*., 1998; PERRENOUD, 2000; ALARCÃO, 2006; LESSARD, 2006; TARDIF, 2006; PERRENOUD; THURLER, 2008; FREIRE, 2011; LIBÂNEO, 2014). Knowledge consists of actions that arise and are refined in the daily environment of teaching and learning.

It is necessary to expand the definition of what constitutes knowledge, distinguishing it from understanding and competence. It is understood that knowledge implies mastery of information, skills, and procedures related to a specific profession, rich in unique actions and understandings. Knowledge inherently involves a relationship with information, beliefs, skills, and abilities that a given profession demands to be well practiced. Knowledge underpins the understanding and actions inherent in professional practice.

In the context of the classroom and teacher professional development, the term knowledge may have a similar but not identical sense to the term understanding, and in turn to the derivative term knowledge. Professional knowledge in this research is understood as an activity of the teacher's praxis of a subjective nature, of socio-cultural origin, and emerges as the basis for consolidating knowledge and competencies for teaching practice. Professional knowledge is a domain of information, possessing skills, and making use of general, non-standardized, and non-rigid procedures related to the teaching profession.

According to Therrien (2006), knowledge manifests as a rich and symbolic apprehension of the reality of knowledge, associated with the practical activity of teaching. It is understood that knowledge is produced based on experiential knowledge, being more systematic and organized than the latter. Knowledge manifested through experiential knowledge or practical knowledge is transformed by the figure of the teacher. Therrien (2006, p. 411) states that it is "constructed in the interstice of everyday social praxis as a social actor, educator, and teacher

in interaction with other subjects and in relation to the plurality of other available teacher knowledge."

Together, knowledge and understanding can foster the emergence of both competencies and skills, resulting from praxis and the ability to articulate worldly knowledge for work and social relations, and also promote the integration of scientific, technological, and sociocultural knowledge in pursuit of social transformation. Knowledge and understanding manifest according to the situations that arise in daily life and the experiences that require the subject's given enhancement of their praxis, and subsequently the employment of certain competencies.

Alarcão (2006) states that competence is the effective use of knowledge to act in everyday life. In this sense, competence is the mastery of knowledge that gives the teacher knowledge of standards, methods, and procedures, qualifications, or abilities for the exercise of their function. Therefore, there is no competence without knowledge, as competencies instrumentalize and organize knowledge, elucidating its dynamism and functional value (ALARCÃO, 2006), making people capable of achieving something.

It is understood that competence defines and outlines personal qualities of understanding the world and some skills forged in the wisdom of coexistence and social relations (ALARCÃO, 2006). These skills or actions, as sociocultural competencies, support the individual in addressing complex problem situations of diverse origin and nature (PERRENOUD, 2000; ALARCÃO, 2006; PERRENOUD; THURLER, 2008), so common in the school environment.

3 METHODS

The research was conducted following the premises of a bibliographic study carried out by Machado (2022) and aimed to identify articles, books, and conferences related to the knowledge, understanding, and competencies necessary for teaching practice. The research covered the keywords: teaching knowledge, formation knowledge, reflective practices, pedagogical knowledge, theoretical and practical knowledge. The research data were obtained from the SciELO (*Scientific Electronic Library Online*) platform, widely used in Brazilian universities.

The scope of the search was centered on the fields of Education, Educational, and Teaching, covering the topics: Education, Research, and Educational and Teaching investigation. The types of documents used in the search were: articles, books, review articles, and citable and non-citable editorials. To broaden the search field, a specific filter was applied for research between the years 1980 and 2020 considering three languages: English, Portuguese, and Spanish. The SciELO portal requires the use of previously tested strings that use boolean logical operators such as (*), (*AND*), and (*OR*). The first operator allows the association of subjects, the second facilitates the inclusion of two or more themes, and the last ensures the insertion of different themes associated with a given researched subject (MACHADO, 2022).

The research was directed, as it sought subjects of specific scope linked to the function and training of teachers, teacher knowledge, understanding, and practice. After collecting the material, the scanning technique, which searches for specific

words leading to a given piece of information, was used, followed by the skimming technique, which consists of exploring and reviewing documents.

A floating reading technique (BARDIN, 2011) was applied to all cataloged materials, which ensured the identification of similar and differentiated aspects among the materials read (MACHADO, 2022). This allowed the emergence of characteristics that evidenced the constitution of teacher knowledge, competencies, and understanding. The technique required the initial reading of the titles, abstracts, and keywords of the selected materials, followed by a more in-depth second phase of reading the abstracts and results achieved.

This action was important to verify if the contents covered have a direct or indirect relationship with the research object (MACHADO, 2022). In a third stage, the final considerations of the research were analyzed so that the data compilation could be carried out. The research had an exploratory and qualitative nature, considering qualitative research with the use of different approaches on teacher knowledge and conduct in the classroom.

The research resulted in the compilation of 40 initially studied materials, which were then narrowed down to a group of 12 authors who were more comprehensive and focused on the subject. After analyzing the materials, it was decided to follow a similar analytical path to the studies of Lessard (2006) in order to group a set of research conducted between 1980 and 2020, as shown in Table 1.

The studies bring, nevertheless, a range of definitions, understandings, and typifications of teacher knowledge, understanding, and competencies and present a significantly large variety of authors proposing to define and organize the plurality, composition, and heterogeneity of teacher knowledge. The understandings and definitions are multimodal and varied, making it difficult, but not impossible, to make a comparison between so many existing definitions.

Mindful of formative needs and the emergence of actions that reinforce reflection on the practice of knowledge in various learning environments, some nomenclatures about the knowledge, understanding, and competencies necessary for the teacher's practical activity will be presented. A brief association and appreciation are proposed here precisely to avoid the existing range of entangled meanings and the polysemy of terms, ultimately understanding that the conceptual significance of the vast majority of the authors studied is similar, facilitating the approach and a brief comparison between the ideas of the scholars researching the theme.

In view of the definitions already presented about the expressions of teacher knowledge, understanding, and competence, some conceptions of authors such as Shulman (1987), Grimmett and Erickson (1988), Van der Maren (1995), Gauthier *et al*. (1998), Perrenoud (2000), Schön (2000), Tardif (2006), Lessard (2006), and Freire (2011) regarding the didactic tripod necessary for teaching activity, its definition, characterization, and identified interrelation will be reported. It is hoped that with these definitions, the necessary understanding of teacher knowledge throughout this research will be supported, which will underpin the understanding of teaching action sedimented on multiple actions and understandings.

4 RESULTS

The classification and categorization of data during the mining of information about teaching knowledge follow a similar classification to that made by Lessard (2006). The author gathered a group of theorists who proposed typologies on teaching knowledge, understanding, and competencies. Thus, the roster of researched authors was regrouped after successive readings, considering the multiplicity of information, concepts, their definitions, characterization of procedures, and developmental actions favorable to the teaching function, namely: 1) pedagogical and didactic knowledge (SHULMAN, 1987); 2) knowledge for teaching and action (SCHÖN, 2000); 3) work knowledge (TARDIF, 2006); 4) theoretical and practical knowledge (PERRENOUD, 2000); 5) guiding knowledge (FREIRE, 2011); 6) teaching knowledge (*GAUTHIER et al.,* 1998); and 7) strategic knowledge (VAN DER MAREN, 1995).

It is understood that the research conducted by the cited authors is too complex to discuss exhaustively, and that knowledge, understanding, and competencies are not intended to cover the totality of domains and actions necessary for the effective practice of teaching. They will be explained in order to primarily clarify general aspects of the authors' understanding of the theme that delineates the identity, function, and work of the teacher, and consequently the domain and constitution of their profession. The research also includes some authors such as Grossman (1990), Alarcão (2006), and Mizukami (2006) who complement, interpret, classify, and expand the ideas listed about teaching knowledge.

4.1 Didactic and pedagogical knowledge

According to Marcon (2011), knowledge is idiosyncratic products of memories, feelings, and information about certain content and the educational environment in which teaching and learning processes occur. Shulman (1987) asserts that the teacher holds foundational knowledge that enables them to engage in educational action, summarizing it into seven different components: 1) content knowledge; 2) pedagogical content knowledge; 3) pedagogical knowledge; 4) curriculum knowledge; 5) knowledge of students and their characteristics; 6) knowledge of the educational context, and 7) knowledge of goals and values.

Shulman (1987) further reveals that the teacher possesses a type of professional repertoire that underpins and supports their knowledge base. This base contains groups of knowledge that sustain teaching actions to promote new understandings for students (MIZUKAMI, 2006), termed didactic knowledge.

It is worth mentioning that the research conducted by Grossman (1990) interprets Shulman's (1987) ideas in a particular way and indicates the existence of only four components of the knowledge base: 1) content knowledge; 2) general pedagogical knowledge; 3) pedagogical content knowledge, and 4) context knowledge. It is emphasized here that, regardless of the interpretive line arising from Shulman's original ideas (1987), the teacher needs to recognize the importance of the knowledge base and its relationship with daily life and teaching actions to perform their work excellently.

Similarly to Shulman (1987), Tardif (2006) understands that the teacher needs knowledge, which consists of a set of conceptions, understandings, predispositions, and knowledge constructed at different moments and contexts in the teacher's life trajectory, and brought into the school environment. Through them, the teacher in the full exercise of their profession will be able to assume a necessary and unique identity to consolidate their pedagogical praxis. Content knowledge is associated with the content specific to their teaching area, constructed by the sciences, and transformed into teachable materials in a didactic-pedagogical sense, referring also to the knowledge to be taught and the knowledge to be taught.

General pedagogical knowledge corresponds to the set of knowledge perceived in teaching actions, expressing educational concepts and principles, as well as organization, management, and planning of learning situations, wherever they occur (SHULMAN, 1987). Pedagogical content knowledge refers to the association of teaching strategies and methodologies and the curricular knowledge of content and appropriate and targeted proposals for the teaching process (MARCON, 2011), while curriculum knowledge reveals knowledge about the curriculum framework, its intentionality, and formative proposition through the articulation and standardization of knowledge that has its own order.

Knowledge of students and their characteristics portrays a teaching domain over the conceptions and preconceptions that students possess, with their acquired experiences. Students' experiences are rich in skills and reveal the baggage of specific types of student knowledge and understanding. Knowledge of the educational context results from the teacher's interaction process with the student body and its cultural, political, social specificities with their personal values.

The last of the knowledge cited by Shulman (1987) refers to goals and educational values and adds information about proposals, justifications, philosophy, beliefs, objectives, and expectations about the teaching process. Its origin is related to pedagogical content knowledge (PCK) and requires the teacher to have a differentiated ability to mobilize a vast array of knowledge of various orders about the teaching context, its multidimensionality, immediacy, unpredictability, about learning situations, the student and their knowledge, tensions and contradictions, and even about the content to be taught, making them understandable to the learner.

4.2 Knowledge for teaching and action: know-how

Schön (2000) sharpens the study on necessary actions and behaviors for teaching practice. The author understands that professional development and lifelong learning depend on the teacher's ability to reflect on their own practices. Schön (2000) perceives the teacher as a subject who engages in reflective practice, whose knowledge is built in the everyday of their profession, through reflection on action and in action. Part of Schön's (2000) research is grounded in Dewey's (1989) investigations into learning from the perspective of carrying out a given activity, whose act itself is designated as doing something.

His theory, known as Epistemology of Practice, has its conceptual framework associated with knowledge in action and reflection in action. For Schön (2000),

knowing in action means knowing how to do something. And this process of knowing-how constitutes a disposition to act spontaneously, freely, and immediately stemming from knowledge already acquired by the teacher. Reflection emerges as an epistemological element of thought about one's own representations and ideas about the action taken and unexpected problem situations in the teaching and learning environment.

According to Schön (2000), there are three distinct types of reflection: reflection on action, reflection in action, and reflection on reflection in action. Reflecting in action means thinking during the performance of a certain action, allowing it to flow in its epistemic nature, giving a form and different clothing to each intervention made by the teacher, which interferes with the development of the ongoing action and generates different kinds of knowledge. Reflecting on action involves thinking about an action already lived and objective. It allows us to discover how our knowledge-in-action contributes or not to achieving the results of the action taken

4.3 Knowledge of work - Kow to be and know-how

The knowledge of work is associated with professional training and the practice of teaching. They indicate what teachers think about their own knowledge. Tardif (2006) highlights the existence of four basic knowledge related to the activities performed by teachers in classrooms: 1) knowledge of professional training (initial or continuing); 2) disciplinary knowledge (administered by the scientific community); 3) curricular knowledge (programs with objectives, content, methods); 4) experiential knowledge (knowing-doing and knowing-being).

The knowledge of teaching work is of a personal nature, arising within the family and educational process of each individual, being integrated into teaching practice in its historicity and during the phase of primary socialization. They are knowledge of school formation, built throughout the teacher's school life trajectory, and reinforced in interaction and socialization even before there is professional training at universities (Tardif, 2006). These knowledges also result from professional training, internships, and exchanges of experience with other teachers.

The knowledge of professional training is acquired in university education and in processes of continuing education. It has its core in the Sciences of Education and pedagogical ideology, constituting knowledge transmitted in academia through teacher education programs. They are intended for teacher training proper. They are pedagogical knowledge associated with teacher education, constituted by the ideological framework of dominant doctrines incorporated by teachers during the formative process with their standardizations and guidelines for development.

On the other hand, disciplinary knowledge is those selected by Higher Education Institutions and offered in the form of disciplines. It has roots in cultural tradition and social groups and reflects a diversified set of knowledge. Curricular knowledge refers to the programs presented and implemented in schools with their objectives, justifications, contents, and teaching methodologies. Finally, experiential knowledge is the knowledge acquired and perfected during the

exercise of teaching professional practice and incorporated into individual and collective experience. They are recognized as know-how and how to be.

These knowledges have experiential biases, as they constitute a teaching culture in action (Tardif, 2006), depend on conditioning factors, and require improvisation, competencies, and specific skills for their exercise, due to the transience of actions and educational practices that occur in a multicultural school environment, and require obligations and norms to which teaching work is subjected. They lead to the habitus (Bourdieu, 1971 cited by Perrenoud, 2000) of know-how and how to be resulting from the integration between knowledge, competencies, skills, and procedural and developmental actions (Tardif, 2006) for teaching.

How to be is a personal knowledge of biographical nature, which evokes subjective characteristics of the teacher and outlines conduct during the actions that each individual performs in learning spaces when teaching classes (Perrenoud, 2000; Tardif, 2006). This knowledge is reflective and gives the teacher, even if he is not aware of it, an uncommon wisdom about the actions taken, their results, and prime objectives about his way of being a teacher.

4.4 Teaching competences

Perrenoud (2000), in his research, associates a set of requirements and demands with teaching professionalism and grouped competences into ten components: 1) Organizing and directing learning situations; 2) Managing the progression of learning; 3) Designing and evolving differentiation devices; 4) Engaging students in their learning and their work; 5) Working in teams; 6) Participating in school administration; 7) Informing and involving parents; 8) Using new technologies; 9) Facing the duties and ethical dilemmas of the profession; 10) Managing one's own continuous training.

These competences aim to situate the orientation of the process of continuous training of teachers, in order to make it cohesive and coherent with the current calls of the educational system and the school. Competences are instruments of integration between teaching knowledge and actions performed at a given moment and under certain circumstances in the educational environment, leading to the construction of teaching pedagogical knowledge.

Each competence is linked to a tacit knowledge of the teacher and allows for an interconnection between academic knowledge and experiential knowledge. This interconnection, in turn, generates what Perrenoud (2000) calls procedural knowledge, which makes clear the way of being and doing of each teacher. Procedural knowledge is rich in knowledge and representations and constitutes part of teachers' knowledge. For Perrenoud (2000), knowledge constitutes Bourdieusian *habitus*, which are operational schemes that dispose a given actor and mobilize him to conform and guide his own actions within the customs and practices of a specific culture, arising naturally in everyday life, from spontaneous situations and routines already internalized by teachers. Habitus consist of experiential information, rich in decision-making capacity, interpretation, (re)reading, matured perspectives, and often (re)experienced by teachers.

It is the exchanges that regulate and allow the teacher to direct their gaze to the educational action of the immediate context (Perrenoud, 2000), and also

provide the emergence of a process of reflection and a better understanding of their reality. As teaching practice develops in interaction with other human beings at the mercy of trial and error, there is a complex exchange between teachers and students, teachers and teachers, and between teachers and other participants in the school environment, providing the ability to mobilize various cognitive schemes, some matured and others not yet, to face specific types of problem situations. *Habitus* are amalgams of practices and refined routines already sedimented in the cognitive system of more experienced teachers (Perrenoud, 2000; Tardif, 2006).

4.5 Guidance knowledges - Knowledges necessary for educational practice

For the educator and philosopher Freire (2011), the ongoing experience of the teacher-educator is a *sine qua non* condition capable of efficiently and effectively guiding the teaching and learning process. Freire (2011) considers that each individual brings with them accumulated knowledge, through which the educational development process can occur. He further asserts that teaching is not merely about transferring knowledge or content, and that it is through the teaching process that individuals learn while teaching, and by learning, they are able to teach while learning something (FREIRE, 2011).

Freire (2011) believes that knowledge and enlightenment are factors that favor human emancipation through more reflective practice, and that throughout the learning process, each individual can be led to develop an inherent epistemological curiosity about the human condition. The teacher, in exercising their role as an educator, teaches and learns dialogically and gnosiologically (FREIRE, 2011). Learning in the context of Freirean dialogicity relates to the teacher's capacity to know how to listen, know how to speak, know when to remain silent, know how to act, and know how to interact (AZEVEDO, 2009) in the discursive exchanges established in the educational environment.

The knowledge of teaching practice for Freire (2011) is knowledge of guidance, and being inherent to the teaching profession, it is enhanced through collaboration, sharing, organization, and systematization of experienced practices by university professors or professional teachers (AZEVEDO, 2009). Freire (2011) considers that whoever teaches, teaches something and teaches something to someone, and that the act of teaching requires knowledge already previously acquired. Teaching is therefore an (re)adaptation of an action of teaching previously performed, transforming it into the previous action of knowing something beforehand (FREIRE, 2011). The previously acquired knowledge is incomplete, dynamic, plural, fluid, and transforms in the interaction between different subjects in the educational act.

In the Freirean context, when the educator affirms that teaching is not transferring knowledge, it is understood that there is knowledge that needs to be learned beforehand, and the teacher needs to know how to teach-and-learn. This means that there is no learning without teaching, and there is an inherent (re)action to the act of teaching, which corresponds to learning, as Freire (2011) affirms. This, in turn, demands from the teacher a set of actions and behaviors to ensure teaching practice. Being a teacher is being an active, critical, responsive,

and creative subject that fosters autonomy in the classroom environment, capable of directing students' volitions and moments of learning.

Being a teacher and educating is humbly and persistently educating oneself in an (also epistemological) restlessness (FREIRE, 2011). For Freire (2011), the act of teaching requires research, and thus, the teacher must know how to research from the Sciences to organize the teaching process in a cohesive, coherent, correct, and socio-culturally aligned manner with the scientific knowledge of each society at the time in which they live.

For Freire (2011), teaching requires respect for the knowledge of the learners. It is up to the teacher to know how to respect the students' knowledge, their origin, their transformative processes, their constant capacity for transformation, taking them as the basis for building and systematizing new, more refined knowledge to promote advancements in the educational process. Teaching requires critical thinking, and it is up to the teacher to know how to be and become critical from knowledge that promotes reflection on the (of) problem situations experienced by students (FREIRE, 2011).

Teaching requires aesthetics and ethics (FREIRE, 2011). Man as a social being is endowed with objectivity and great subjectivity. It is precisely about the learning of human subjectivity that ethical and aesthetic teacher knowledge emerges, in which individuals must understand and perceive themselves as subjects-in-the-world-with-others. This relationship with otherness is fulfilled by the varied forms of expression of man and society that act, interact, experience, modify, are modified, and transform themselves and others (FREIRE, 2011).

Teaching requires the embodiment of words by example (FREIRE, 2011). It means that through the vivid and experienced example of the actors in the educational process, embodied knowledge occurs. Regarding embodied knowledge, Freire (2011) argues that words are of no use if not supported by cohesive attitudes and examples, in other words, there must be congruence of actions and thoughts to think and act in the same way. Teaching requires critical reflection on practice (FREIRE, 2011) and demands from the teacher a practical-reflexive knowledge in a continuous act of action-reflection-action, recognizing the positive aspects of their educational action, as well as the critical points in a constant search for improvement of their own practice.

Finally, Freire (2011) mentions that the act of teaching requires the recognition and assumption of the cultural identity or a cultural identity-knowledge of the teacher. This means that there is no teaching without learning, since teachers and students jointly construct new knowledge in a dialogical, open, frank, and honest relationship that takes the student's life reality as the starting point for teaching and learning actions.

4.6 Pedagogical teacher knowledges - Craft of knowledges

The studies by Gauthier *et al.* (1998) were based on the evolution of some researches dealing with the effectiveness of the teaching process and similarly address the basic elements constituting Pedagogy, as a Science of Education. The knowledge structured by Gauthier *et al.* (1998) relies on a defined, rich, clear, and objective repertoire of knowledge derived from teaching practice.

Their research allowed for the organization of the crafts of teacher knowledge, concerning the act of teaching by the teacher. They are: craft of knowledge, knowledge without craft, and craft made of knowledge (GAUTHIER *et al.,* 1998). In the craft of knowledge, knowledge comes from the teacher's experience and intuition, knowledge without craft is characterized by the overvaluation of the formalism of pedagogical practices and methods, and the craft made of knowledge consists of actions built from the multiple knowledge that the teacher appropriates in the exercise of their teaching practice (GAUTHIER *et al*., 1998; AZEVEDO, 2009; GAUTHIER; BISSONNETTE, 2017).

In the studies developed by Gauthier and colleagues, six components of pedagogical teacher knowledge were structured: disciplinary knowledge, curricular knowledge, knowledge of educational sciences, knowledge of pedagogical tradition, experiential knowledge, and finally, knowledge of pedagogical action (GAUTHIER *et al.,* 1998).

Disciplinary knowledge results from the appropriation of knowledge of the contents to be taught (SHULMAN, 1987) and is constructed by scientists and researchers in different areas and existing sciences. Even though they are not produced by teachers, these knowledges must be appropriated and transformed in order to be taught. Curricular knowledge, which regulates teaching actions on content and the curriculum framework, is included in the curricular programs of schools (GAUTHIER *et al.,* 1998) and concerns the nature of knowledge in the contexts in which they occur, circumscribed in the educational process.

The knowledge of educational sciences results from the appropriation of professional knowledge and is not necessarily linked to the educational act but may have been acquired during academic training or through teaching work. This knowledge delineates the teaching profession and brings to it, in particular, the base of knowledge that other professionals do not have about teaching.

Gauthier *et al.* (1998) indicates that the knowledge of pedagogical tradition comes from the knowledge brought by the teacher even before professional training but adapted by experiential knowledge. It can be understood as knowledge of the lessons, rich in representations and understandings about the figure and role of the teacher, the school, the lessons, etc.

The knowledge of pedagogical action can be defined as the experiential knowledge of the teacher, being less developed among the knowledges that the teacher possesses. It can be understood as a set of norms and behaviors already interpreted about the teaching function, which is very particular and depends on publicity and testing to be valid, consistent, and permanent.

Experiential knowledge encompasses the situations developed in the experience of the classroom, sometimes remaining confined to this environment. It has a strategic, immediate bias, rich in mannerisms and tricks that the teacher can use in carrying out activities or in teaching. Experiential knowledge arises from the integration of judgments and values that the teacher makes throughout their professional career.

4.7 Strategic knowledges

These are knowledges associated with the capacity for teacher intervention in the environment where teaching and learning processes take place (VAN DER MAREN, 1995). The knowledges are designated by Van der Maren (1995) as: *savant* knowledges (general learned knowledge), applied knowledges, artisanal or experiential knowledges, and strategic knowledges. *Savant* knowledges or knowledges of general academic knowledge have their roots in the fields of Psychology, Sociology, Linguistics, Education, and Philosophy and constitute the general culture of teachers. They have also undergone didactic transposition, a more assimilable linguistic adaptation, and are more directed towards the teacher knowledges that need to be learned.

Applied knowledges can be designated as technical knowledges, applicable according to an approach for solving problem situations, devoid of arguments or demonstrations (VAN DER MAREN, 1995). These knowledges serve to prepare the teacher's action, even if it does not occur as planned, they serve to evaluate and correct the strategies used and allow the teacher to adjust, redirect, and revise the steps taken in the experience of educational situations presented in the classroom.

Craftsman knowledges, or artisanal knowledges, are the knowledges of the *metiér*. Such knowledges are shared by individuals who master a technique, a peculiar and distinguishable handling from other professionals. They are knowledges learned in the cooperative relationship between individuals, who copy and replicate a given action. They are non-logical, non-rational knowledges whose "aesthetics and ethics are beyond scientific rationality" (VAN DER MAREN, 1995, p. 10). These knowledges have a dual character, partly rational and partly not so logical. Their rational characteristic concerns what the teacher knows about their action and practice performed in the work environment, while their partial lack of logic underlies the teachers' lack of knowledge about some of these knowledges.

When questioned, teachers do not know that they possess certain knowledges, nor why they perform specific actions that lead students to learn content. And when asked about such knowledges, they cannot find a complete answer to explain how their actions were carried out and continue to be performed (VAN DER MAREN, 1995), even though these knowledges are constructed and refined during their teaching practices.

Van der Maren (1995) cites in his studies the strategic knowledges (*savoir stratégique)* that arise from the association of applied knowledges and praxis that will be put into action. They include constitutive elements of practice, artisanal knowledges, and a set of rules and conduct of action. The author asserts that experiential knowledge is important in the construction of strategic knowledges, precisely because of the association of applied knowledges in teaching action.

Table 1 presents a synthesis of the main theories and their theorists listed in this research. The ideas were classified according to Lessard's perceptions (2006) and have been expanded in the course of this research. The authors worked on in the research are highlighted in bold.

Table 1 - Grouping of researched theorists.

Author	Year of Research	Designation	Typification in the didactic tripod
Shulman	1987	Pedagogical and didactic knowledges	Knowledges
Labaree	1992	Power and teacher knowledge	Understanding
Grimmett apud Grimmett and Erickson	1988	Artisanal knowledges	Knowledges
Van der Maren	1995	Strategic knowledges	Knowledges
Gauthier *et al.*	1998	Knowledges' profession	Knowledges and competences
Kennedy	1999	Work knowledges	Knowledges and competences
Perrenoud	2000	Theoretical and practical knowledges	Competences
Schön	2000	Knowledges for teaching and action	Knowledges
Therrien	2006	Knowledges of practical teaching activity	Knowledges
Tardif	2006	Work knowledges	Knowledges and competences
Lessard	2006	Work knowledges	competences knowledges Understanding
Freire	2011	Leadership knowledges	Competences

Source: Adapted from Lessard's classification (2006).

It is understood that knowledges are linked to knowledge and that, in turn, these are associated with competences. In this interim, mastering specific knowledges and competences in the process of teaching and learning development requires a strong integration between the use of instrumental/technological, pedagogical/curricular, didactic/methodological, investigative/evaluative, communicational/relational, and personal/attitudinal resources (PERRENOUD, 2000; MIZUKAMI, 2006; PERRENOUD; THURLER, 2008; GUZMAN; NUSSBAUM, 2009) for the teacher to carry out their function.

Understanding one or several knowledges contributes to the professionalization f the teaching role and to the realization of the teaching and educational activity of the teacher. And it is precisely in the exercise of the teaching activity that the nature and purposes of knowledges emerge, providing competences and skills for those who intend to be teachers.

5 CONCLUSIONS

In different ways, but with similar meanings, some of the concepts brought by the scholars presented here reveal an approximation between the concepts of knowledge and understanding, and that teaching requires a set of actions, understandings, procedures, and skills built on a solid base of experiences inherent to the act of teaching. The constant readings of different authors and theorists allow for a sharper understanding that there are convergences and divergences among teacher knowledges, understanding, and competences.

While Gauthier *et al.* (1988) and Freire (2011) focus their theories on the ethical-political-social aspects of knowledges, Tardif (2006) centers his research on the role of knowledges necessary for the teaching profession. However, it is worth noting that teacher knowledges for Gauthier *et al*. (1998) and Tardif (2006) are multifocal and can be evaluated from various points, although they have not conducted joint research, they are able to discuss in similar ways and meanings about disciplinary knowledges, curricular knowledges, pedagogical tradition, and knowledge of educational sciences (professional training).

On the other hand, Shulman's research (1987) brings something innovative about pedagogical content understanding, as it associates each teacher's personal experience with specific contents. Shulman (1987) believes in teaching as a profession and that teachers must have a solid knowledge base to teach. All teaching activity for the teacher takes place in a cycle that involves understanding, transformation, instruction, evaluation, and reflection, forming a dynamic and cyclical model of Pedagogical Reasoning and Action (SHULMAN, 1987). Similarly, Therrien (2006) understands that understanding by the teacher, as a construct that manifests itself as a symbolic apprehension of reality, in which understanding would be primarily associated with knowledges of practical teaching activity.

From another perspective, Freire (2011) understands that being a teacher requires meeting specific demands, epistemological curiosity, and creativity, imposing the duty and obligation of the teacher to work with the authority-freedom binomial, aiming to develop autonomy and critical-reflexive capacity in the individuals involved in the process of educating themselves, others, and the world around them. For Schön (2000), the teacher goes through a challenging process of overcoming daily challenges, which requires coherence in decision-making and revisiting decisions, without which reflection would not be able to be stimulated.

Perrenoud (2000) understands that if the teacher "is not able to invest his knowledges with discernment, to relate them to situations, to transpose and enrich them, they will not be useful to him for action" (PERRENOUD, 2000, p. 180). Competences are what call on the teacher to act urgently and decide in the uncertainty (PERRENOUD, 2000) of daily actions in the school environment. Thus, the teacher will reveal themselves to be competent by knowing how to act, demonstrating the understanding mobilized and the set of actions employed in the coherent resolution of the problems witnessed. This implies knowing, knowing how to do something, and being someone endowed with the conditions to perform a given task, function, or professional activity that requires reasoning, anticipation, judgment, creation, approximation, synthesis, and taking risks, as advocated by Perrenoud's research (2000).

Van der Maren (1995) in his research understands that teacher knowledges emerge from critical theorization of educational praxis, which must be preceded by investigative processes supported by reflection on practical actions, which in turn enable the construction of a knowledge called praxiological. With this practical professional understanding, the teacher will have a better chance of understanding and appropriating a personal and consistent professional practice. Van der Maren (1995) in his theory about strategic knowledges, states that experience and practice in the constitution of a corpus of understanding are prerequisites, both to train and to evaluate teaching action, provided that the occurrence and experience of concrete situations are considered.

The authors have in common the belief that: a) teacher knowledges come from different sources; b) the idea that there is a need for experiences and practical experiences, successful or not, that are capable of critically challenging the teacher and that allow for reflection, inventive capacity, adaptability, coherence, c) knowledges and understanding are honed in the tension between regulation and modulation of teaching activities; d) knowledges underlie the ability to solve problems.

In light of the above, it is understood that experiential knowledges are associated with classroom experiences and resemble Van der Maren's artisanal and applied knowledges (1995) and Gauthier *et al.'s* (1998) experiential knowledges. In common, these knowledges require competences in organizing and directing learning situations and addressing the duties and ethical dilemmas of the profession mentioned by Perrenoud (2000) and the know-how and how to be defined by Tardif (2006).

The knowledges of experience call upon the teacher to reflect on action, as essential to teaching practice as stated by Schön (2000), and allow for understanding-in-action as well as require the teacher to have knowledge of students and their characteristics and the educational context indicated by Shulman (1987).

Regarding the scientific knowledges listed by Tardif (2006) that provide clarity and meaning to the knowledge taught in school, it is perceived that they are related to *savant* knowledges (VAN DER MAREN, 1995), disciplinary knowledges (GAUTHIER *et al.,* 1998; TARDIF, 2006), encompassing content knowledge (SHULMAN, 1987). Such knowledges invite the teacher to teach through research and acceptance of the new (FREIRE, 2011) and similarly allow understanding-in-action to be transformed, promoting more flexibility in content approaches (LESSARD, 2006).

Pedagogical knowledges enable the teacher to acquire practical understanding of their role in the practice of teaching and must articulate pedagogical practices with initial training and the teaching environment in the school. These knowledges share the similarity and meaning of the strategic knowledges proposed by Van der Maren (1995), the pedagogical action knowledges of Gauthier *et al.* (1998), Tardif's (2006) pedagogical knowledges, and Shulman's (1987) general pedagogical knowledges. This allows and empowers the teacher to critically reflect on their own pedagogical practice (FREIRE, 2011) as they potentially involve teaching actions carried out with students and their learning, in various work environments (PERRENOUD, 2000).

By knowing the knowledges and their nomenclatures, differentiating the ideas of the authors who address the theme, one can understand that consistent initial and ongoing training should support teachers in the full exercise of their professional activity. That said, it is understood in light of the definitions and theories listed, that teachers need conceptual and attitudinal knowledges, understanding, and procedural competences to carry out educational action.

SABERES, CONHECIMENTOS E COMPETÊNCIAS DA FORMAÇÃO E PRÁTICA DOCENTE

RESUMO

Este trabalho apresenta conceitos e crenças que amparam as ações do magistério, com suas definições e tipificações acerca dos saberes, conhecimentos e competências comuns à formação e à prática docente. Caracteriza-se como um estudo exploratório focado na análise e revisão de literatura em pesquisas de natureza qualitativa. A pesquisa resultou na identificação de 40 estudos, dos quais foram selecionados 12 investigações realizadas entre os anos de 1980 e 2020. Traz um entendimento adicional sobre os saberes e conhecimentos docentes e suas nomenclaturas, e difere as ideias dos autores que abordam a temática. Esse arranjo investigativo favorece a compreensão de que a ação docente consistente deve ser amparada por procedimentos, técnicas, práticas e experiências profissionais, e traz para si uma personificação identitária do saber-fazer docente exercida e reconhecida sobre conceitos e atitudes, conhecimentos e competências procedimentais para o exercício da ação educativa.

PALAVRAS-CHAVE: Saberes docentes. Conhecimentos de ação pedagógica. Ofício de saberes; Identidade docente.

NOTE

1 Available at: https://revistas.utfpr.edu.br/rbect.

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