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RESEARCH ARTICLE

REFLECTIVE ANALYSIS OF THE PROFESSIONAL PRACTICE OF THE SCIENCE AND MATHEMATICS TEACHER IN PRIMARY SCHOOLS IN MOROCCO

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ABSTRACT

The analysis of educational practices is one of the mechanisms for improving training and improving performance in the teaching profession, as it is a process of deserving, understanding and interpreting the special approach adopted by a person in a context during his teaching, in order to think and insight into it with a view to modifying and developing it. This will lead to improving his performance and developing his professional competencies. In view of the importance of practice analysis in providing the trainee professor with the mechanisms of insightful analysis of his own practice, it has been added to the training kit of teachers in the regional centers for the professions of education and training starting from the training year 2018 in Morocco, This is in line with the directions of the strategic vision for reform 2015-2030, which affirmed in the ninth lever that the renewal of the professions of education and training is an essential entry point for improving the educational system, raising the profitability of Moroccan schools and ensuring their attractiveness and feasibility. The process of training the professor begins in the analysis of practice, starting from the first year of his qualification in the regional centers for the professions of education and training, through a workshop on the analysis of practice and field activities in educational institutions, and then continues in the second year of qualification during the in-person training courses and during his assumption of the responsibility in school, and this requires multiple interveners in the analysis of practice: the component professor, the accompanying professor, the educational inspector, and the practicing professor who performs self-analysis of his unique practice in teaching. The inclusion of the practice analysis workshop in the training kit of the teaching staff and the multiplicity of stakeholders requires the unification of visions on the act of analysis, and in this context the goal of our research crystallized, which is to prepare a database of illustrated lessons in the subjects of scientific activity and mathematics in the primary sector, in order to invest it in organizing workshops to analyze practice on the one hand, and to unify the tools for analyzing the professional practice of teachers in educational institutions on the other hand, in order to propose an effective tool for analyzing the professional practice of teachers of scientific subjects in primary school, including all components and dimensions of practice teaching and investable by all stakeholders in this process.

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INTRODUCTION

In order to follow the world's transformations and developments in science and knowledge, including those related to education, training, scientific and technical research and innovation, the Higher Council for Education, Training and Scientific Research in Morocco has taken the initiative to develop a new strategic vision for educational reform 2015-2030 with the aim of improving the quality of the educational relationship and educational practices.

The basic and continuous training of teachers is therefore an input to the quality of the educational system in various educational wires, whether primary, secondary preparatory or secondary qualifying, and in all subjects, so the training began to take a strategic dimension in recent years by linking the theoretical side with the practical side according to Pradigm practical-theoretical-practical, and perhaps the addition of two workshops analyzing professional practice and didactic production in the training kit for teachers in the regional centers for education and training professions, starting from the training year 2018, is the best evidence of this trend towards renewing professions education, training and profession in Morocco, as training

in practice analysis helps the teacher to possess basic competencies, and develop the ability to analyze his professional behavior in its various dimensions of didactic, pedagogical and interactive to understand and modify his practices, and to gain insight into them continuously in order to improve his performance. In view of the importance of mathematics and scientific activity, enabling the learner to know skills, values and attitudes that strengthen his personality and his mental, reasoning and methodological abilities, and motivate him to research, investigate and interact positively with scientific knowledge and prepare him to contribute to the development of his society, and given that primary education constitutes the first building block for the development of a scientific sense that makes the learner able to initiative, problem solving, innovation and openness to the values of science and scientific research, there was an urgent need to conduct a study to diagnose the reality of analyzing the professional practice of teachers of mathematics and scientific activity. in primary, as a workshop in the training kit for teachers in the regional centers for the professions of education and training, and as an educational action in primary education institutions in order to monitor constraints and difficulties, and Providing a database of videos to be invested in the basic or continuous training of teachers, in order to prepare a unified and effective tool for analyzing practice, applicable to all those involved in the educational process, including practicing professors, accompaniments, trainers and educational inspectors.

Theoretical framework

“Analysing one's professional practices" is now a recognised skill and is being and implemented in many projects concerning the professional development projects of a group or individuals. The "knowing how to analyse" (Altet, 1994) (1) present in official texts and in different professional fields as texts, and in different professional fields such as education education, training, health and social fields the many devices that claim to be based on this new skill. that claim to be based on this new competence. For Philippe Perrenoud, (2004) (2) "The reflective practitioner is a practitioner who looks at himself in a mirror and tries to understand how he does it, and sometimes why he does, what he does, possibly against his will". The trainer in charge of a training group is concerned with a very specific field of expertise which aims to accompany the professional movement. The trainer in charge of a training group is concerned with a very specific field of expertise which aims to accompany the professional shift in a dynamic of change (Rogers, 1968/1998) (3). This shift frequently produces an epistemological change affecting professional identity (Giust-Desprairies, 2002) (4). In any case, it is this new and very specific 'posture', in the sense that Perrenoud, 2005, 31) (5) identifies it: "Reflective practice is first of all rooted in a posture, a relationship to the world, to knowledge, to complexity, an identity" that which allows us to work on the part of the personality that each invests in their profession (Balint, 2003) (6). The evolution of This posture thus accompanies the reorganisation of identity and encourages the development of the professional subject characterising the central aim of the training in our reflective analysis of practices.

According to the literature (7-16), the main ideas and perspectives emerging from studies and research in the field of practice analysis are:

- The concept of professional practice analysis: The literature emphasises that professional practice analysis is a reflective process in which teachers critically examine their own teaching practices. It involves reflection on classroom experiences, decisions made and their impact on students.
- Reasons and purposes of practice analysis: Teachers are motivated to conduct practice analysis for a number of reasons, including improving their teaching skills, solving classroom problems, and continuing professional development. The aim is to encourage in-depth reflection on existing practices in order to make adjustments and improvements.
- Methods and approaches: The literature suggests different methods and approaches for conducting analyses of professional practice. These may include reflective journals, interviews with colleagues or trainers, classroom observations, or the use of digital technologies to document and analyse teaching practices.
- Impact of practice analysis: Research suggests that analysis of professional practice can have positive effects on teachers and their teaching practice. It can lead to an increased awareness of their educational beliefs and values, a better understanding of students' needs, and adjustments in teaching strategies to meet those needs.
- Contexts and issues: The literature highlights the importance of considering the social, cultural and institutional contexts in which practice reviews take place. Teachers are influenced by factors such as educational policies, professional cultures and interactions with colleagues. It is therefore essential to take these dimensions into account for a relevant analysis of practice.

It can be concluded that Reflexive analysis of the professional practice of teachers is a field of study that focuses on critically examining and reflecting upon the teaching methods, experiences, and beliefs of educators. It involves engaging in self-reflection, considering the social and cultural contexts of education, and examining the impact of teachers' actions and decisions on students and their learning outcomes.

Problem statement: Specialists in the field of education and training agree that teaching is a very complex professional practice, as it requires knowledge and familiarity with the various relationships that bind the components (knowledge, teacher, and learner); therefore, professionals had to think about their own practice in both work and training. This explains why the Ministry of National Education has included the practice analysis workshop in the training kit for teaching staff in regional centres for education and training professions. However, the multiplicity of stakeholders in the training of teachers and the absence of a database of situations that can be invested in workshops to analyze professional practice in teaching require the development and establishment of a technical tool for the analysis of professional practice that takes into account the overlap of the dimensions of classroom practice in direct relation to professional facts and phenomena related to thinking and insight into practice. Given the current urgent need to consolidate visions on practice analysis among the various stakeholders in

- In view of the urgent need at the present time to unify visions on the analysis of practice among the various stakeholders in framing the educational action among the trainee teaching staff and tracking their actual practice in the recruitment institutions, this research deals with the subject of analyzing the professional practice of teaching scientific subjects (scientific activity and mathematics) in the primary corps, and to take note of all aspects of the problem raised, it has been divided into the following questions:
- What is the reality of the classroom performance of the teaching staff in the subjects of scientific activity and mathematics in the primary sector? What are the difficulties and constraints associated with field practice?
- How are the professional practices of teaching staff analyzed during training and practice in light of the constraints associated with the professional reality?
- What are the obstacles to analyzing the practice of teachers scientific activity and mathematics in primary school?
- What is the effective and appropriate tool or tools to analyze the various aspects of actual professional practice (personal, relational, didactic, pedagogical...) for teaching scientific activity and mathematics in primary school?

Research Objectives: This research seeks to achieve the following goals and objectives:

- Diagnosing the reality of analyzing the professional practice of teachers of mathematics and scientific activity in primary school in Morocco;
- Develop and establish an integrated tool and provide effective tools for the analysis of professional practices to increase the quality of learning;
- Assisting the teacher in diagnosing the reality of his practice and monitoring its imbalances in order to correct them, whether through self-training or continuous training by proposing a model of the tool for analyzing educational practices, and determining how to invest them in the educational and learning process.

Research Methodology and tools

METHODOLOGY

In light of the objectives of the study, and the questions that it tries to answer, the field survey approach has been applied to achieve the objectives because it suits the nature of the studied subject and answers its questions related to collecting data on the reality of analyzing practice in educational institutions in primary education in the subjects of scientific activity and mathematics. This research is also considered a procedural research that aims to understand and study the phenomenon in order to prepare effective tools for analyzing practice

Research Tools: Due to the descriptive nature of the applied research, four different and integrated tools have been adopted to encompass all aspects of the topic:

Questionnaire: In this research, we relied on a form to collect field data on the reality of analyzing the practice of teachers in primary education, a questionnaire consisting of a set of questions related to the subject of the study and includes 4 sections (axes):

- **Personal data:** This axis included the general characteristics of the target group (gender, type of appointment institution, educational level, type of educational certificate, seniority in the profession...).
- **Difficulties related to teaching mathematics and scientific activity in primary school:** His questions center on the difficulties faced by the learner in learning mathematics and scientific activity, as well as those that the teacher encounters in teaching these two subjects and ways to overcome them.
- **Training axis:** includes questions about the nature of the training received by the research sample and information about the training in the practice analysis.
- **Conduct a practice analysis:** His questions revolve around the procedures for analyzing the practice and the constraints that prevent it, in addition to proposals for the development of the teacher's professional competencies.

Interview: Interviews were conducted with those involved in the qualification and supervision of the teaching staff in the field of practice analysis to obtain some additional information about the reality of training in the workshops of practice analysis in mathematics and science, how it is dared and the tools used to accomplish it, as well as monitoring the convergence and differences between all those involved in the rehabilitation of teaching staff in Morocco.

Filming lessons: Classes for teaching mathematics and scientific activity in primary school have been recorded for some teachers practicing in the field, to be used as a means of analyzing practice within the framework of this research as well as to build a database 'vidéothèque' that invests in the training of teaching staff trainees at the Regional Center for Education and Training Professions Beni Mellal-Khenifra (workshop on analysis of practice, professional situations...).

Practical workshops: Based on the results of the questionnaire and the interview, practical workshops were organized to:

- Sharing observation and practice analysis networks;
- Develop a common tool for the analysis of practice;
- Try the tool by investing in some illustrated lessons.

sample: The research community and its appointment consist of 100 teachers of science activity and mathematics in the primary school in the Beni Mellal-Khenifra region in Morroco, 20 trainer in Regional Center for Education and Training Professions, 10 accompanying professors in educational institutions, and 10 inspectors of primary education in the region.

RESULTS

Access to any profession is closely related to acquisition of basic competencies that have not disappeared, and awareness of the roles entrusted to them, and the overlap and importance of all components, mechanisms and mechanisms of the educational and learning act made attention mainly directed towards the teacher and the renewal of his profession as an essential input to the quality of the educational system. As the conditions for practicing the profession were constantly evolving, the teacher's job became highly complex. He has become required to keep abreast of developments, accept change, confront constraints, and address difficulties by adopting the logic of reflexive analysis. In this context, the importance of analyzing professional practice, in basic and continuous training, is highlighted in strengthening teachers' professional vision, improving their performance, helping them to acquire basic competencies, and developing the ability to analyze their teaching work in its various personal, didactic, pedagogical and interactive dimensions, in order to understand and modify their practices and gain insight into them on an ongoing basis.

- Accordingly, and by unpacking the results of the questionnaire that we adopted in the preparation of this study, we noticed that despite the awareness of the majority of teachers of mathematics and scientific activity in primary school of the importance of analyzing practice in developing their professional performance and overcoming difficulties and constraints that can hinder the success of the teaching and learning process, only a small percentage of them are aware of the subject and have a partial knowledge of the meaning of this type of analysis and its mechanisms, and it is this same population that regularly analyzes its professional practice based on the observation network, and by focusing only on some aspects of the didactic and pedagogical dimensions due to its inability to other dimensions, the most important of which is the communicative relational dimension, without which the analysis is not possible. This explains why the largest percentage of respondents does not have any information about the analysis of professional practice.
- The interview technique with those involved in the educational process (formed professors, educational inspectors and accompanying professors) has also enabled us to monitor very important results, as most of them train and supervise the analysis of practice based on personal jurisprudence without benefiting from any training in this field. This led to their different representations and approaches, and thus their multiple methods and understanding of the process resulting from this analysis.
- The preparation of a data bank of videos and the investment of some of them to test the tool developed, based on the results of field research as well as through sharing workshops with teachers of mathematics and scientific activity in primary institutions, enabled us to produce a unified procedural tool for the analysis of the teacher's professional action with the aim of strengthening the analysis, modification, continuous development of his practice and raising its quality.

Table 1. Analysis grid developed in the framework of this research

The stages	components of each stage	Observed dimension	weeknesses	strengths	difficulties	Problems	Theoritical contribution/	Proposal for modification
Starting situation	1.… 2.… 3.…	the pedagogical						
		the didactic						
		the relational						
		the contextual						
		…						
Construction phase	1.… 2.… 3.…	the pedagogical						
		the didactic						
		the relational						
		the contextual						
		…						
Evaluation step	1.… 2.… 3.…	the pedagogical						
		the didactic						
		the relational						
		the contextual						
		…						

The following is the proposed model, which is a network for analysis and the stages of its application (tables 1-7).

- Analysis grid developed
- Application stages of the analysis grid developed

The "Altet" model was adopted as the model adopted in the education and training system in Morocco, which was generalized within the framework of the first axis of the Education Program 2 related to basic and continuous training for teachers. This model includes four basic steps: observation, problematization, analysis, and theoretical model, to suggest ways to modify and develop practice. These steps will be detailed in the following:

Stage 1: Spontaneous observation

At this stage, the sample members were directed to observe the practice in a random manner, where all procedural actions performed by both the teacher and the learner are monitored and described according to Table 2.

Table 2. Results of spontaneous observation

Teacher Activities	Learner Activities

Stage 2: Guided observation using tools

At this stage, observation networks are used taking into account the same methodology as for spontaneous observation. A codified observation using an official observation network based on criteria and indicators that enable tracking the presence or absence of the teaching methodology adopted in the school subject. Expected result from this stage: Filling in the observation grid

Stage 3: problematisation

Participants in the sharing workshops were instructed to identify what was problematic in practice by adopting a set of questions and filling out Table 3.

Table 3. Results of the problematisation stage

the questions asked	what is the problem	Why? the impact of this problem on the achievement of the objectives of the session

From the questions asked about the observed situation, we draw out what poses a prominent problem in practice and affects the achievement of the objectives of the class.

Stage 4: Analysis

At this stage, a network of dimensions of practice was adopted, in order to isolate a certain aspect or aspects of the practice where the discussion was focused on the imbalances that are marred by them, and to propose hypotheses to overcome these imbalances. The participants in the sharing workshops were directed to find the relationship between the various aspects of the practice in order to understand them and give them significance and meaning and focus the analysis on the dimension that includes more imbalances and which negatively affects the process of learning action in a way that exceeds the impact of the rest of the dimensions, by identifying the pros and cons in each dimension and identifying the main imbalances in practice according to Tables 4 and 5.

Table 4. Results of Phase 1 of Analysis step

dimension	strengths		weeknesses	
	teacher	student	teacher	student

Table 5. Results of Phase 2 of Analysis step

Dimensions	Imbalances	Their impact on the didactic act of learning	hypotheses Why does it have an impact on the didactic-learning act?

Stage 5: theorization

After discussing hypotheses about the impact of imbalances associated with the various dimensions of the extracted practice on the didactic and learning act based on conceptual tools and theoretical references that enable understanding and interpretation of procedures, a dimension or set of dimensions is retained and the theoretical references that frame it are determined according to the table 6.

Table 6. Results of the theorization stage

The associated imbalance dimension	theoretical reference

Stage 6: Proposal to amend the practice under analysis

Based on the theoretical framework, what needs to be done for each dimension is determined, and this is done by identifying the activities and actions that need to be done to correct the imbalances observed. Thus giving proposals for adjusting the practice as set out in Table 7.

Table 7. Results of the adjustment phase

Dimension and/or	associated imbalance	What to do based on the theoretical framework	Modification and adjustement proposals

CONCLUSION

In the light of the results of this research and based on the suggestions of the various groups concerned with the analysis of the practice covered by the research, the opinion of the research team was settled on providing a set of recommendations and practical proposals aimed at improving the professional performance of teachers by raising their abilities and skills and enabling them to analyze and improve the practice, whether at the stage of their rehabilitation in training institutions, or during their career path in recruitment institutions, and these recommendations include:

- Strengthening coordination between the various stakeholders in the training of trainee teaching staff at the Regional Academy for Education and Training and the Regional Centres for Education and Training Professions, and activating its institutional mechanisms (Regional Leadership Committee, Regional Coordination Committee);
- Regular organization of sharing workshops involving all stakeholders in the analysis of practice at the regional and regional levels in order to consolidate visions and concepts on the conduct of practice analysis and the achievement of the desired quality;
- Organization of continuous training courses for practicing professors to develop their abilities to analyze and gain insight into practice;
- develop a national expertise in the analysis of the professional practice of teachers.
- Establishment of a data bank for video lessons at the Regional Centers for Education and Training Professions. And expand the circle of volunteers to film lessons.
- Providing libraries of educational institutions with theoretical references on the analysis of practice to inform teachers of the mechanisms of conducting it, and organizing workshops for continuous training in this field.

In this regard, it is worth emphasizing that our research is still ongoing, because our results are preliminary results that do not surround all aspects of the problem, as it was programmed to experiment with the tool regionally and regionally, Therefore, the topic of our research opens new horizons as an introduction to future research proposals, including:

The effect of circulating the proposed tool on teaching the rest of the subjects and the rest of the wires in order to revise and develop them

- The impact of the analysis of teacher professional practice on the quality of learning;
- The impact of the analysis of the teacher's professional practice on the development of the ability to solve mathematical problems;
- The relationship of professional practice analysis to the development of the ability to investigate and scientific research.

This work establishes the foundation for a solid research project in the field of analysis of the professional practice of teachers based on the principle of addressing the phenomenon based on daily classroom practice by involving all actors and interveners from the region, with a view to consolidating the concept of the new Moroccan school integrated into its environmental, social and educational environment.

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