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Professionalization Engineering As A Lever for Improving the Pedagogical Supervision of Primary School Teachers in the Moungali 2 District of Brazzaville

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Abstract
In a Congolese educational context marked by pedagogical supervision practices that are still largely prescriptive, this study explores the contribution of professionalization engineering to improving the skills of primary school teachers.
It is based on an experiment conducted in the Moungali 2 district, notably in the SOPROGI A and B and Moukondo A and B schools in Brazzaville.
The research compares two groups of teachers, one trained in this engineering, the other not, on their ability to adapt their practices, overcome field constraints and promote transferable learning.
The results show that trained teachers develop more contextualized, reflective and effective practices, both for their professional development and for student performance. The study concludes that professionalization engineering is a strategic lever for rethinking pedagogical supervision with a view to the sustainable professionalization of educational players.

Keywords: Professionalization engineering; pedagogical supervision; primary education; Republic of Congo, Moungali 2 district in Brazzaville

General Introduction

In a world where educational requirements are constantly evolving, school systems are forced to rethink their professional support mechanisms, particularly in primary schools, the foundation of all civic and academic training.
In the Republic of Congo, despite the reforms initiated through the Education Sector Strategy (ESS), educational support systems remain largely prescriptive, normative, and often unsuited to the complex realities on the ground.
Primary school teachers face multiple challenges, including diverse populations, overcrowded classrooms, and a lack of resources, without benefiting from support adapted to these concrete conditions.
In this context, professionalization engineering appears to be a strategic lever for transforming educational support into a more contextualized, reflective, and constructive approach.
It offers an approach based on the analysis of work situations, the development of on-the-job skills, and the co-construction of professional knowledge.
The use of this engineering would enable a shift from top-down supervision to collaborative support centered on teachers' actual practices.
Reflection on professionalization engineering applied to the pedagogical supervision of primary school teachers is part of a renewal of theoretical frameworks, emphasizing reflexivity, contextual anchoring, and the co-construction of professional skills.

Several recent research streams converge around this logic, challenging traditional prescriptive approaches in favor of situated and transformational support.

In the field of professional didactics, recent work extends the foundations laid by Pastré by emphasizing the analysis of professional situations as a basis for skills development. Clauzard (2021) emphasizes the importance of conceptualization in action, in a dynamic where the professional must constantly adjust their actions to the variability of the field.

This approach places a central role on the teacher's actual activity, considered as a matrix of contextualized knowledge. Furthermore, GRCID research (2024) shows that collaborative workspaces around teaching activities promote collective learning by highlighting the gap between prescribed and actual action.

Training support, for its part, is evolving toward systems that promote intersubjective reflexivity. Clerc, Langlo, and Breton (2022) highlight the need to reshape the supervisor's stance by focusing on listening, supporting practices, and recognizing the emotional dimensions of teaching.

Support is no longer limited to performance evaluation, but is becoming a space for discussion, shared analysis, and the development of transversal skills, such as uncertainty management, initiative, and the ability to innovate pedagogically. Activity analysis, inseparable from professionalization engineering, is emerging as a relevant methodological lever for transforming educational practices.

Belhaj (2023) emphasizes that this approach, based on the co-construction of training tools between researchers and practitioners, makes it possible to identify the constants of activity and support teachers in guided reflexivity processes.

These mechanisms allow us to go beyond simple remediation to a logic of progressive professionalization, adapted to real-life teaching contexts.

In sub-Saharan Africa, several recent initiatives confirm the relevance of a contextualized and situated approach.

The IFADEM program (2023–2024), like the programs developed by APPRENDRE in several French-speaking countries, implement training designs adapted to local realities: overcrowded classrooms, scarce resources, linguistic diversity, etc.

These programs show that traditional prescriptive approaches reach their limits in complex environments, and that pedagogical support based on concrete situations is more transformative.

These observations are consistent with the findings of Tourni et al. (2023), who advocate for the decolonization of training programs through the integration of contextual intelligence and culturally anchored knowledge.

Finally, the work of El-Hamamsy et al. (2023), focusing on digital training in primary education, illustrates the extension of professionalization engineering to hybrid programs, combining in-person and distance learning.

These approaches focus on the progressive empowerment of teachers through a cascade model, heavily involving educational supervisors in transmission, support, and assessment.

They confirm that professionalization engineering, as a structuring process, can support sustainable reforms when designed in close collaboration with stakeholders in the field.

Contemporary research is converging towards a redefinition of the role of educational supervision: it is no longer a matter of imposing standards, but of building professionalization trajectories with teachers that are based on their realities, constraints, and dynamics of development.

Professionalization engineering thus appears to be a promising avenue for supporting transformations in the teaching profession, particularly in African contexts marked by significant structural challenges. Problem

Pedagogical supervision in Congo is based on a rigid institutional framework, prescribed by poorly contextualized texts and circulars.

However, teachers operate in environments marked by the variability of learning situations, which often renders these prescriptions ineffective.

This discrepancy calls into question the effectiveness of current supervision practices: how can we support teachers in a sustainable professionalization process without reconfiguring the systems themselves? Could professionalization engineering, focused on skills and real-life work situations, meet this need to adapt and transform pedagogical supervision?

Main Research Question

From this problem, we can formulate our following main question: to what extent can professionalization engineering improve the pedagogical supervision of primary school teachers in Congo, taking into account field realities and institutional constraints?
Through this main research question, we can address the following secondary questions:

- What are the social, technical, and economic determinants that influence the quality of pedagogical supervision? • How do teachers perceive traditional support and its limitations?
- What changes have we observed in the practices of teachers who have benefited from training based on professional development engineering?

The hypotheses of our research stem from secondary questions, which can be broken down into a primary hypothesis and secondary hypotheses, which we will test in our overall conclusion.
Secondary hypotheses:

- Systems based on the analysis of work situations enable more effective adaptation to pedagogical realities;
- Teachers trained in professionalization engineering develop more innovative, collaborative, and motivating practices;
- Supervision redesigned according to this engineering positively influences student performance.

The overall objective of this study is to analyze the contribution of professionalization engineering to improving pedagogical supervision of primary school teachers in Congo. From this overall objective, the following specific objectives arise:

- Identify gaps between official requirements and actual supervision practices;
- Evaluate the effects of a training system based on professionalization engineering;
- Propose avenues for improving pedagogical supervision while taking into account the social, technical, and economic constraints of the Congolese education system.

This research adopted a qualitative approach, which will be further developed in the remainder of this paper (Section 1). Thus, this article will be divided into three sections: Section 1 aims to expand on the methodology of this research paper; Section 2 presents the results; and finally, Section 3 concludes this article with a specific focus on discussing the results.

Section 1: Methodology

As Descartes said, methodology is the path that allows researchers to find the truth. In this article, a qualitative approach was adopted to explore the effects of professionalization engineering on supervisory practices.
The study was based on an experiment conducted in the Moungali 2 district of Brazzaville.
Therefore, two (2) groups of teachers were formed: a control group (not trained in engineering) and an experimental group (trained in professionalization engineering). The experiment lasted six months and employed the following methods:
• Direct observation in classroom situations;
• Semi-structured interviews with teachers, inspectors, and educational advisors;
• Document analysis of the support tools in use;
• Student performance assessments.
The sample included six teachers (three per group), educational supervisors, and institutional stakeholders involved in teacher support.
The analysis focused on teachers' ability to apply their skills in context, adapt their practices, and engage in professional development.

Section 2: Results

The comparative analysis of teaching practices between the two groups of teachers (trained vs. untrained in professionalization engineering) highlighted several significant trends, which demonstrate the tangible impact of the experimental design on the professional development of teachers in Group B.
1. Enhanced pedagogical adaptability
Teachers trained in professionalization engineering demonstrated an increased ability to adjust their teaching strategies according to the specific needs of their students.

Unlike teachers in the control group, who were often constrained by the strict application of official guidelines, teachers in Group B were able to mobilize differentiated practices, design sequences adapted to heterogeneous levels, and establish a more inclusive classroom dynamic.
This pedagogical flexibility, aligned with the work of Clauzard (2021), demonstrates a controlled and effective conceptualization in a real-life situation. 2. Effective mobilization of transferable skills
Group B distinguished itself by a more systematic integration of pedagogical approaches promoting problem solving, collaborative projects, and the co-construction of knowledge with students.
These teachers were able to create complex learning situations conducive to anchoring knowledge and transferring it to real-life contexts, in line with the principles of activity analysis formulated by Belhaj Amor (2023).
Conversely, Group A was more focused on repetitive tasks, which were not conducive to the mobilization of transversal skills.
3. Creative management of material constraints
Despite a teaching environment often marked by limited resources, the trained teachers demonstrated a notable capacity for pedagogical innovation, leveraging local resources (recycled materials, open-source digital tools) and adapting content to contextual realities.
This capacity for ingenuity is consistent with the findings of the IFADEM program (2023), which highlights the importance of training teachers to contextualize knowledge and adapt to systemic constraints.
4. Renewed professional motivation
The field survey also revealed a stronger sense of professional self-esteem among teachers in the experimental group. They expressed greater autonomy, stronger commitment, and a renewed sense of their educational mission.
This dynamic is in line with the formative support models advocated by Clerc et al. (2022), in which recognizing the professional as a reflective subject is a key factor in the appropriation and transformation of practices.
5. A measurable improvement in student outcomes
Students supervised by teachers in Group B achieved higher scores in formative assessments, particularly in subjects requiring critical thinking, problem-solving, and initiative-taking. These results support the idea that supervision based on professionalization engineering can have a positive effect not only on teachers but also on learner performance.

Section 3: Discussion
The results obtained confirm the relevance and effectiveness of professionalization engineering as a structuring lever for transforming pedagogical supervision in primary education in Congo.
Indeed, this engineering anchors support practices in experienced professional realities, breaking with the top-down and prescriptive logic that still largely prevails in the Congolese education system.
The dynamics observed in the experimental group concretely illustrate the theoretical contributions identified in recent literature: activity analysis (Pastré, Belhaj Amor), the promotion of professional reflexivity (Clauzard, Clerc), and the adaptation of training programs to African contexts (IFADEM, APPRENDRE).
Trained teachers no longer simply reproduce handed-down models: they become agents of their own professional development, capable of diagnosing needs, designing relevant pedagogical responses, and adjusting to field constraints.
However, the effectiveness of this engineering relies on a number of structural conditions. It requires an institutional environment conducive to experimentation, a continuing education policy aligned with the real needs of practitioners, and a space for collaboration between teachers, supervisors, and researchers.
Without these levers, the observed effects risk remaining confined to isolated initiatives.
Furthermore, the sustainability of these transformations requires greater recognition of the role of educational supervisors, often confined to administrative or supervisory roles, whereas they could become true mediators of professional development, provided they themselves are trained in professionalization engineering.
Ultimately, this study provides evidence in favor of a paradigm shift in pedagogical supervision, which would move from a prescriptive model to a co-constructed, situated, reflexive model, and one geared toward

the professionalization of educational stakeholders. It opens up promising prospects for a systemic reform of teacher training and support in French-speaking African contexts.

Conclusion

The objective of this article was to analyze the contribution of professionalization engineering to improving the pedagogical supervision of primary school teachers in Congo. Through a qualitative experiment conducted in several schools in Brazzaville, the study compared two groups of teachers, one trained in professionalization engineering and the other not, in order to observe the effects of this approach on teaching practices, professional stance, and student performance.

The results obtained confirm the primary hypothesis that professionalization engineering significantly contributes to improving pedagogical supervision.

Teachers in the experimental group demonstrated greater adaptability, better mobilization of transferable skills, and renewed professional commitment, thus validating the theoretical foundations linked to professional reflexivity (Clauzard, 2021; Clerc et al., 2022) and activity analysis (Belhaj Amor, 2023).

Furthermore, the secondary hypotheses are also confirmed:

• The trained teachers were able to adapt their practices to real-life situations, consistent with Pastré's (2021) perspectives on conceptualization in context;

• The experimental approach has fostered pedagogical innovations in a context marked by material constraints, as also demonstrated by the IFADEM (2023) and APPRENDRE (2022) projects;

• Finally, the academic results of students supported by Group B teachers show measurable progress in skills mobilizing autonomy and critical thinking, confirming the positive impact of contextualized supervision.

However, these transformations cannot be sustained without consistent institutional support. Implementing this engineering requires a supportive structural framework: recognition of the strategic role of educational supervisors, a continuing education policy anchored in local realities, and the development of spaces for professional co-regulation.

Thus, professionalization engineering cannot be considered solely as a technical tool, but as a paradigm shift in the way we think about supervision. It engages a systemic approach to skills development, based on the analysis of real-life activity, shared reflexivity, and the co-construction of professional knowledge.

At a time when educational challenges in sub-Saharan Africa require contextualized responses, this research makes a significant contribution to the reconfiguration of teacher support models with a sustainable and professionalizing perspective.

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