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Instructional Supervision in Burundi's Secondary Education: Practices, Perceptions, and Supervisors' Self-Efficacy

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Abstract

This study, carried out with supervisors (directors/education prefects) (N = 37), from 20 schools spread over five regions of Burundi, focused on the practices and perceptions of supervisors, including their sense of self-efficacy. Factor analyses made it possible to identify the supervision models, the different phases of this process as well as the guidelines for professional development (PD). Furthermore, the analysis of variance (ANOVA) showed that public schools and those under contract have more advanced supervision approaches than private schools, and the t-test showed that directors and education prefects share similar perceptions regarding supervision practices and professional development (PD). Finally, the correlations indicate that supervisors feel more competent when they benefit from or implement structured, interactive and practice-oriented supervision.

Keywords

Instructional Supervision, Secondary Education, Supervisory Practices, Supervisors' Perceptions, Self-Efficacy, Professional Development

1. Introduction

Instructional supervision (IS) is widely recognized as an essential pillar for improving the quality of education, as it provides teachers with structured professional support aimed at refining pedagogical practices (Glickman et al., 2014; Sergiovanni, 2013). By stimulating critical reflection, distance from practices, and continuous adjustment of classroom interventions, IS contributes significantly to the development of teachers' professional effectiveness (Marzano, 2017). In several African countries, where education systems face persistent challenges related

to quality, equity and resources, much work emphasizes its crucial role in improving learning and supporting educational actors (UNESCO, 2015).

Although self-efficacy is recognized as a major determinant of motivation, professional engagement and performance, as it influences the supervisor's perception of their ability to achieve their goals (Walter, Shenaar-Golan, & Greenberg, 2015; Hattie, 2008), the literature remains limited in Burundi regarding pedagogical supervision practices and their influence on supervisors' self-efficacy (Ndayizeye, 2018). This lack of knowledge thus prevents fully understanding how supervisors experience, exercise and interpret their role in transforming school context.

This article thus aims to examine the practices and perceptions of pedagogical supervisors in secondary education in Burundi, with a particular focus on the links between instructional supervision and supervisors' self-efficacy. This work seeks to contribute to the still emerging literature on PS in Burundi and to enrich the understanding of the professional dynamics that influence the effectiveness and development of supervisors. In order to address this gap, the present study aims to analyze the structuring of the practices declared by secondary supervisors, using an exploratory factor analysis (PCA with varimax rotation). Disparities based on the type of institution (public, under contract, private) are examined through analyses of variance (ANOVA), while the divergences in perception between directors and study prefects are evaluated using a t-test for independent samples. Finally, the interrelationships between supervisory practices and personal, professional and collective efficacy beliefs are explored through Pearson correlations. This methodological approach thus ensures a rigorous consistency between the research objectives and the statistical analysis used.

1.1. Problem and Context

In many African countries, IS is recognized as a central mechanism to improve the quality of teaching and support the continuous professional development of teachers. UNESCO analyses mention several structural challenges: shortage of qualified teachers, overcrowded classes, regional disparities, low availability of teaching materials and insufficient initial training that hinder supervision (UNESCO, 2015, 2019). In this context, the organization emphasizes the importance of a formative type of supervision, focused on support, constructive feedback and professional accompaniment, rather than on logic of administrative control. Studies conducted in East Africa further indicate that regular supervision practices based on classroom observation, reflective analysis, and collaborative development of instructional strategies strengthen teachers' self-efficacy while contributing to improved learning outcomes (UNESCO-IIEP, 2021). In Burundi, these results are particularly relevant: teachers, often isolated in rural or hard-to-reach schools, have limited resources to enrich their practices, while support mechanisms remain poorly structured (Barahinduka, Voulgre, & Baron, 2015; Ndayiziga, 2017). In African education systems, and more particularly in those of East Africa, pedagogical supervision is widely recognized as a strategic lever to sustainably improve the quality of

teaching. Available studies on Burundi reveal that supervision contributes to strengthening professional practices, supporting teachers, and improving learning, particularly in rural contexts where needs remain most pressing (Barahinduka, Voulgre, & Baron, 2015; Ndayiziga, 2017). In Burundi, these findings are corroborated: RESEN data highlight the decisive role of strengthening supervision to support the professionalization of teachers, particularly in rural areas where needs are most acute (UNESCO, 2015). The Global Partnership for Education also emphasizes that regular and formative supervision practices simultaneously promote equity and quality of learning (D'Angelo et al., 2023).

In this context, analyzing the influence of instructional supervision on educators' self-efficacy and on teaching quality is of major importance for Burundi. Despite the progress made in terms of access to education, the quality of teaching remains a central issue, as highlighted by UNESCO (2019). Teachers, key actors in the education system, require continuous methodological support and real opportunities for professional development in order to meet contemporary pedagogical requirements (Mitchell et al., 2024). Instructional supervision thus appears as a strategic mechanism, offering structured support, targeted feedback and adapted support, which contribute to strengthening pedagogical practices and improving the overall quality of teaching.

1.2. Interest in the Choice of Study

Instructional supervision (IS) is indeed recognized as a fundamental lever for improving teaching practices and school performance. In this perspective, Nzayisenga & Ndagijimana (2023) have highlighted, in the Rwandan context, that the regularity and quality of instructive supervision have a significant impact on student performance. Similarly, the work of Ludigo, Buyondo and Kawemba (2025), conducted in Uganda, confirms that internal supervision practices, such as lesson observation or analysis of pedagogical preparations, are closely correlated with academic success. Abuko & Andala (2024) have emphasized that teachers' positive perception of supervision strengthens their professional effectiveness. Nevertheless, several obstacles hinder the effectiveness of supervision, as revealed by Terra & Berhanu (2019) in Ethiopia: lack of resources, limited training and administrative overload. From a complementary perspective, Bouchamma et al. (2017) have shown that collaborative supervision, particularly through professional learning communities, contributes to developing a strong sense of personal efficacy among school administrators.

In Burundi, this issue is of particular importance given the structural challenges still facing the education system. Despite progress in access to education, the quality of teaching remains a major challenge (UNESCO, 2019). UNESCO (2023) reminds us that teachers, central actors in the educational process, need sustained support and ongoing training to improve their skills. Komba (2017) adds that IS aims to guide teachers through constructive feedback. Moreover, the ongoing educational reforms must be firmly anchored in local realities. The World Bank (2020) insists on the contextual adaptation of educational policies, while Nday-

izeye (2018) mentions the effects of poverty and violence on education. Finally, this research could enrich the academic field by providing valuable empirical data to researchers, decision-makers and school managers (Voulgre & Villemonteix, 2016).

A regular and effective SP contributes to improving trust. To achieve significant impact, it is essential to take into account the factors that influence the effectiveness of SP. The training of pedagogical supervisors and their expertise in education are key factors, as well as effective communication between pedagogical supervisors and teachers, as shown in studies conducted in Kenya (Odhiambo, 2019).

However, as highlighted in a study conducted in Ethiopia (Tadesse, 2020), pedagogical supervisors frequently face obstacles that may compromise their effectiveness, such as lack of resources, inadequate training, or lack of support from educational authorities. Therefore, although IS is a fundamental lever to strengthen teachers' sense of self-efficacy in Africa, it is imperative to identify the factors that influence its real impact and to address the structural constraints encountered in the field.

1.3. Definition: Educational Supervision/Role of the Supervisor

In this research, the term "instructional supervision" or "instructional supervision practices" refers to the models, stages of IS, as well as the professional development activities carried out by school supervisors with teachers. In Burundi, school principals and heads of studies play a central role in the management and supervision of educational institutions (Glickman et al., 2014). According to UNESCO (2019), school principals are responsible for the daily management of the school, which includes supervising teachers, planning and organizing school activities, as well as managing relationships with parents and the community. The heads of studies, for their part, are responsible for supervising pedagogical activities, evaluating academic performance, planning and organizing exams, and coordinating with teachers (World Bank, 2020). These responsibilities are supported in literature, particularly by UNICEF (2021), who emphasize the crucial role of instructional supervision in improving the quality of education. Thus, in the Burundian context, the term "school supervisors" refers to all the actors responsible for accompanying, supervising, and supporting teachers in their daily work.

2. Literature Review

Instructional supervision is widely recognized as an essential mechanism for improving teaching practices and consolidating the quality of teaching. Studies conducted in various contexts show that structured supervisory mechanisms based on planning, observation, analysis and feedback enable the establishment of a continuous process of pedagogical improvement (Glickman et al., 2014). Several supervisory models have been documented in the literature, including clinical supervision, which is based on collaborative support aimed at reflective analysis and professional development (Timperley, 2011), as well as peer supervision, oriented

towards the sharing and co-construction of pedagogical solutions. These models converge towards a formative vision of supervision, focused on professional growth rather than control.

Studies specifically focused on school supervisors show that the way in which they implement the supervision phases directly influences the quality of support offered to teachers. Regular supervision, accompanied by precise feedback, promotes the adjustment of practices and the development of a climate of continuous improvement (Bouchamma, 2006).

2.1. Literature Linking Instructional Supervision and Self-Efficacy

Several studies have also highlighted the interrelationship between supervision practices and the perceived effectiveness of supervisors. For example, Bouchamma (2006) research showed that supervisors who feel competent to observe, analyze and support teachers are more likely to provide consistent, supportive supervision focused on pedagogical improvement. More recent studies, notably (Leithwood, 2012), have conceptualized supervisory efficacy, illustrating that structured supervisory practices strengthen supervisors' confidence in their ability to fulfill their role. Similarly, other studies conducted in African contexts indicate that regular and well-defined supervisory mechanisms not only consolidate pedagogical practices but also strengthen supervisors' perception of their competence to support teachers, particularly in resource-constrained environments (Tessa Bold et al., 2017). These contributions converge to show that pedagogical supervision not only influences teachers, but also produces effects on the confidence, professional commitment and stability of supervisory practices among the supervisors themselves.

2.2. Instructional Supervision in African Education Systems in Burundi

In several African countries, the literature highlights the strategic role of supervision in mitigating regional disparities, supporting teachers, and enhancing the quality of learning. In Burundi, the RESEN analyses and UNESCO reports show that supervision is an indispensable tool for supporting teachers, especially in rural areas where professional isolation, lack of resources, and limited training opportunities prevail (UNESCO, 2015). However, supervisory mechanisms often remain irregular or insufficiently structured, which limits their reach.

2.3. The Role of Context on Supervision Practices

Recent research also emphasizes the effect of institutional conditions on nature and quality of supervision. The availability of educational resources, administrative support, workload, or access to continuous training are all factors that can influence the observed supervisory practices (Tessa Bold et al., 2017). These conditions also play a role in the supervisors' ability to adopt a formative and supportive posture.

Overall, the literature shows that educational supervision is a high-potential mechanism, both for improving teaching practices and for strengthening the professional confidence of supervisors. However, its implementation remains uneven, particularly in Burundi, where the need for support remains high and resources are limited.

3. Theoretical Framework

This diagram illustrates the conceptual framework of SP by highlighting the main theories that compose it as well as their interrelationships. It encompasses the socio-cognitive theory of personal efficacy, the theory of collective efficacy, the theory of transformational leadership, as well as contemporary approaches to SP. Each of these perspectives provides complementary insight into supervisory practices, motivation, collaboration and teachers' PD (Figure 1).

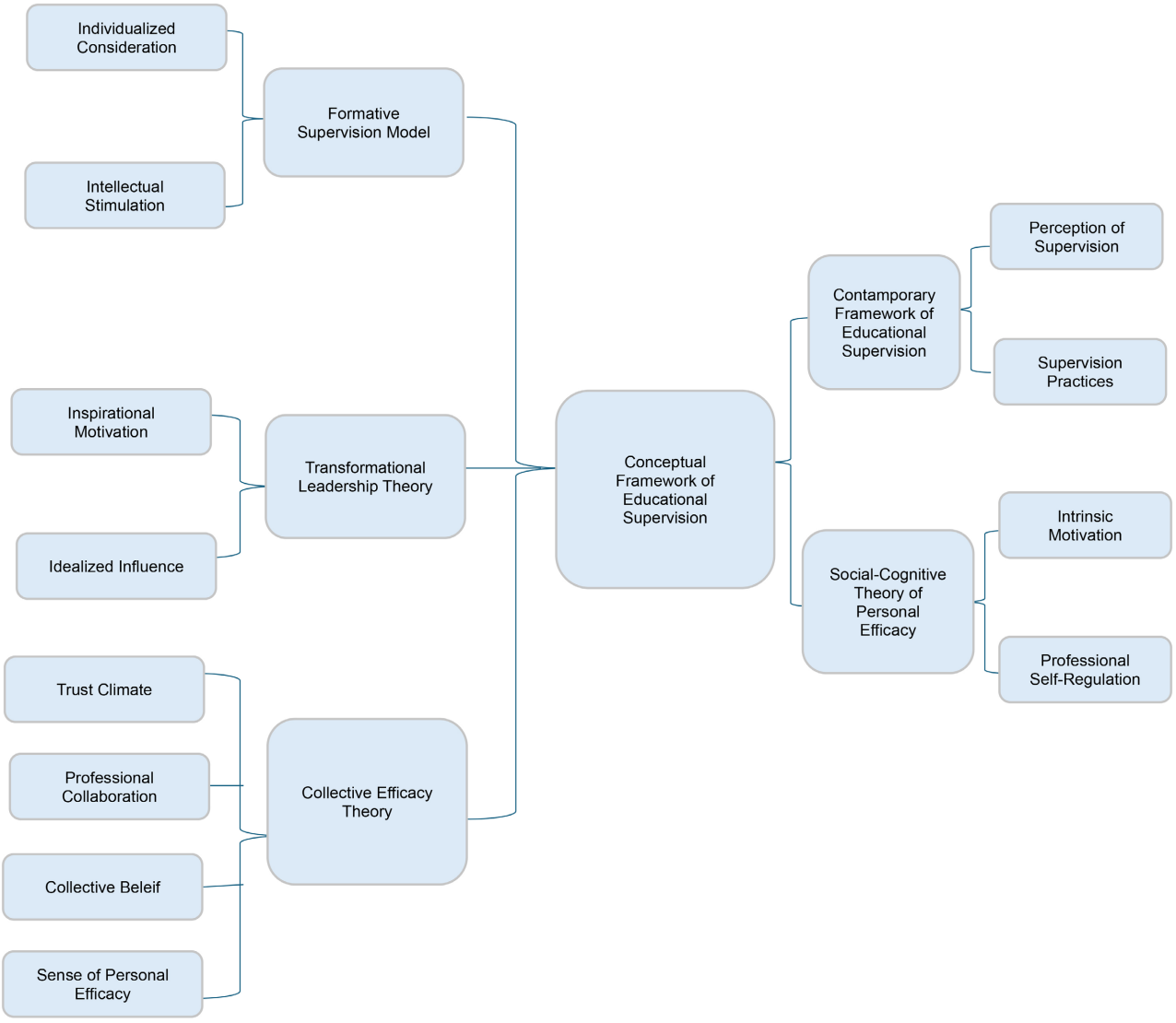

Figure 1. Theoretical framework of SP.

3.1. Socio-Cognitive Theory of Self-Efficacy (Bandura, 1977, 1986)

The socio-cognitive theory developed by Bandura (1977, 1986) postulates that human behavior emerges from a dynamic interaction between the individual, their environment, and their actions. Perceived self-efficacy (PSE) is defined as an individual's conviction in their ability to organize and execute the actions required to achieve a goal. In the educational field, this concept has a considerable influence on motivation, persistence, and the quality of professional practices. Recent research corroborates the relevance of PSE: Tschannen-Moran & Barr (2004) highlight its central role in the quality of support provided to teachers, while Skaalvik and Skaalvik (2020) establish a link between high PSE, job satisfaction, and resilience. Finally, Collie, Granziera & Martin (2018) emphasize that the school climate and institutional recognition reinforce this sense of efficacy, making it essential to the analysis of perceptions and engagement of educational supervisors.

3.2. Collective Efficacy Theory (Bandura, 1997; Goddard, Hoy, & Woolfolk Hoy, 2000)

Collective efficacy, a concept expanded by Bandura (1997), refers to the shared belief of a group in its ability to effectively carry out common actions. In the school context, Goddard, Hoy & Woolfolk Hoy (2004) have shown that this belief significantly influences organizational performance, team cohesion, and educational motivation. More recently, Donohoo, Hattie, and Eells (2018) have proven that collective efficacy is a powerful lever for improving academic achievement and professional well-being. Klassen (2010) add that this shared conviction strengthens collaboration, persistence, and resilience in the face of institutional challenges. Applied to educational supervision, this theory suggests that supervisors who share a strong sense of collective efficacy adopt more consistent and stimulating practices, thereby fostering a culture of collaborative learning and continuous quality improvement.

3.3. Contemporary Theories of Instructional Supervision (Cogan, 1973; Sergiovanni & Starratt, 1983; Glickman et al., 2014)

Approaches to educational supervision have evolved from a traditional, control-oriented model to a formative and reflective supervision. The work of Cogan (1973), Goldhammer (1980), and Sergiovanni & Starratt (1983) established the foundations of clinical supervision, based on cooperation and feedback. Glickman et al. (2014) have further developed this perspective, defining it as a professional development process supported by communication, trust, and collaboration. Recent research by Harris (2020) as well as Hargreaves & O'Connor, (2020) highlights the importance of reflective supervision and shared leadership. These authors emphasize that contemporary supervision aims less to evaluate than to support, by promoting professional growth and collective responsibility in the quest for educational quality, particularly in developing contexts such as Burundi.

3.4. Transformational Leadership Theory (Bass, 1985; Leithwood & Sun, 2020)

Transformational leadership, introduced by Bass (1985), envisions the leader as an actor capable of inspiring, motivating, and positively transforming their professional environment. This model is based on four dimensions: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration. In the field of education, Leithwood (2012) demonstrates that this type of leadership improves team cohesion and strengthens the sense of collective efficacy. More recently, Harris (2020) have revealed that transformational leadership promotes professional engagement and job satisfaction, particularly in complex educational environments. Applied to educational supervision, this approach suggests that supervisors acting as transformational leaders inspire trust, stimulate innovation, and contribute to the sustainable improvement of educational practices.

4. Methodology

This study examines the link between the practices and perceptions of educational supervisors in the field of secondary education in Burundi, as well as the exploration of the relationships between these practices and their sense of personal, professional and collective efficacy.

4.1. Participants and Sample

The data for this research were collected through a questionnaire administered in 20 institutions, distributed across the five regions of Burundi. Of the 40 questionnaires distributed, 37 were duly returned, representing a remarkable response rate of 92.5%. The respondents (N = 37) belong to the chain of educational supervision in Burundi's secondary education and consist of directors and heads of studies from public institutions (54.05%), conventional public schools (40.54%) and private schools (5.40%). Two categories of school administrators were thus selected: the directors and the heads of studies. The study adopted an intentional non-probabilistic sampling, specifically targeting these educational supervisors. This sample, rigorously distributed across the five regions of the country (south, north, center, east and west) as well as across the three types of institutions, can be qualified as a stratified intentional sample.

4.2. Measures

The questionnaires of Bouchamma et al. (2008) and Bouchamma (2006) were used in their entirety, with the exception of a few questions related to context-related characteristics. In this study, the questionnaire was carefully adapted to the Burundian context to ensure the construct validity of the scales used. The original instrument, written in French, was preserved in this language, which is the administrative and academic language in Burundi. Some formulations have been simplified to ensure their clarity. Items deemed irrelevant to the Burundian context have been removed or reformulated. A translation/back-translation proce-

dure was not necessary since the tool was administered in its original language. However, an informal pretest conducted with three supervisors made it possible to adjust some minor formulations and confirm the cultural adequacy. These adjustments aim to ensure that the instrument accurately reflects the supervision practices and the institutional specificities of the Burundian education system, thus consolidating the construct validity of the scales used. This questionnaire consists of five main sections: general information, supervision practices and perceptions, pedagogical supervision practices (individual: 15 items, collective: 27 items, and professional development: 9 items), effectiveness (personal: 8 items, professional: 8 items, and collective: 6 items), and views on the importance of pedagogical supervision. It also addressed the phases of pedagogical supervision (before observation: 4 items, during observation: 2 items, and after observation: 5 items).

4.3. Data Analysis

To identify supervision practices, we conducted a factor analysis with principal component extraction and varimax rotation method on each dimension of the questionnaire (N = 37). Then, we evaluated the reliability of the retained factors using Cronbach's alpha coefficient to determine the internal consistency of each factor. Given the exploratory objective of uncovering the latent structure of supervisory practices within a small sample (N = 37), a principal component analysis (PCA) with orthogonal varimax rotation was favored. This approach yields a simplified and easily interpretable factorial solution, maximizing the variance explained by each component while minimizing cross-loadings. This methodological choice is consistent with the section dedicated to the analysis, where principal component extraction and varimax rotation are explicitly mentioned. On a conceptual level, however, it is recognized that the dimensions of pedagogical supervision, such as preparation, observation, feedback, and support for professional development, may maintain correlational relationships, as they are part of a structured and interactive process. The correlations observed between certain practices and self-efficacy beliefs confirm this functional interdependence. Although orthogonal rotation is justified from a descriptive perspective, internal consistency indices (Cronbach's alphas) were calculated to strengthen the validity of the retained factors. Subsequent analyses could employ oblique rotation to examine the relationships between the dimensions more closely.

However, the small sample size is an important methodological constraint: a low ratio between the number of participants and the number of items can compromise the stability of the extracted factors and the robustness of the results. To mitigate this risk, factor analysis was complemented by robustness checks, including parallel analysis and sensitivity analysis on the number of retained factors, thus strengthening the credibility of the identified structures. Moreover, the use of a non-probabilistic intentional sampling, the lack of methodological triangulation, and the exclusive reliance on self-reported data expose the study to representativeness and social desirability biases, limiting the generalizability of the re-

sults. Despite these limitations, the analyses provide relevant insights into the dynamics of supervision in Burundi and constitute a solid starting point for future research employing larger samples and mixed methodological approaches. Then, we evaluated the reliability of the retained factors using Cronbach's alpha coefficient to determine the internal consistency of each factor. We also performed correlation analysis, t-test, Mann-Whitney (U-Test) and analysis of variance (ANOVA) to examine the relationships between these variables.

In order to ensure comprehensive interpretation and compliance with the current methodological recommendations, we have specified below the additional procedures applied to the analysis of intergroup comparisons, including post-hoc tests and reported effect sizes. We used the Games-Howell post-hoc test for pairwise comparisons between school status, due to the significant heterogeneity of subgroup sizes and variance disparities. In addition to p-values, we report partial eta-squared (η^2p) for ANOVA as well as Hedges' g (with a 95% confidence interval) for each pair.

5. Results

For all the intergroup comparisons reported in this section, *p*-values are accompanied by effect size indices (Cohen's d for t-tests; η^2 for analyses of variance [ANOVA]). When the ANOVA reveals a significant effect, post-hoc comparisons are performed (Tukey HSD in case of homogeneity of variances; Games-Howell when the assumption of homogeneity of variances is not met).

5.1. Factor Analysis

For this research, we conducted a factor analysis using the SPSS statistical software. To determine the number of principal components (PC) to retain, we applied the Kaiser rule, also known as the Kaiser-Guttman criterion. This rule states that only axes with an eigenvalue greater than 1 should be retained for the analysis (Kaiser, 1960; Jolliffe, 2002; Hair et al., 2010; Tabachnick & Fidell, 2013). The results of this analysis allowed us to identify the most common IS practices in secondary education in Burundi.

5.2. Supervision Models

The exploratory factor analysis of **Table 1** composed of 15 items allowed to group the items representing the clinical supervision model into two main factors. The results of the factor analysis of the clinical supervision model reveal four key factorial axes that underlie supervision practices.

Factor 1, entitled personalized adaptation, groups five items. This factor reflects the importance of considering the individual characteristics of each teacher in supervision, to better meet their needs and promote their PD. This factor explains 31.625% of the total variance. The internal consistency of this factor is high, with a Cronbach's alpha of 0.85, indicating a strong reliability of the items that compose it.

Table 1. Rotation of the clinical supervision component matrix.

Clinical Supervision Model	Factorial Axes			
	Fact 1	Fact 2	Fact 3	Fact 4
1) I improve the teacher by addressing directly the observable facts.	0.724			
2) I interact with the teacher in an engaging way.			0.780	
3) I adapt the supervision to the supervisee's needs.	0.652			
4) I adapt the supervision to the supervisee's skills.	0.890			
5) I adapt the supervision to the supervisee's motivation.	0.853			
6) I adapt the supervision to the supervisee's experience.	0.747			
7) I meet with the teacher to establish the points my supervision will focus on.				0.756
8) I plan the timing of my visit together with the teacher.				0.845
9) I discuss the teacher's lesson preparation with them.		0.788		
10) I share one or more observation templates with the teacher to record my observations.		0.824		
11) I observe the aspects on which the teacher and I agreed.		0.856		
12) I ask the teacher to self-evaluate.			0.710	
13) I agree with the teacher on the objectives to achieve for the next supervision.			0.506	
14) I show the teacher how to teach.	0.432			
15) I write a report on the teaching.			0.667	

Factor 2 "Planning and Observation" groups three items related to the preparation and implementation of supervision. This factor reflects the importance of planning and observation in supervision, to ensure a structured and effective approach. This factor explains 19.833% of the total variance, which underlines its importance in the supervision process. The internal consistency of this factor is high, with a Cronbach's alpha of 0.78, indicating a strong reliability of the items that compose it.

Factors 3 and 4, although not meeting the classical conditions of factors due to the limited number of items that compose them, nevertheless seem to reflect important aspects of supervision. The third factor, titled "Pedagogical Evaluation and Monitoring" with three items, highlights the importance of evaluation and monitoring in pedagogical supervision, as it allows supervisors to support teachers in their PD by encouraging them to reflect on their practices, setting objectives to improve their teaching, and documenting the progress made. The fourth factor, titled "Supervision Planning", is composed of two items. This factor reflects the importance of planning and preparation in SP, as it allows supervisors to clearly

define the objectives and expectations of supervision.

5.3. Phases of Supervision

The results of this study have highlighted the presence of two factors determining the importance in SP: collaborative preparation and evaluation and follow-up. The factor analysis of the six items related to the supervision phases highlights a bipolar structure, corresponding to the two fundamental steps of the supervision process. The first factor, which explains 31.20% of the total variance (α = 0.82), refers to collaborative preparation and classroom observation. The second factor, representing 28.10% of the total variance (α = 0.83), groups the elements associated with post-observation feedback, evaluation and follow-up. Together, these two factors account for 59.3% of the total variance and illustrate that supervision is perceived as a process organized around preparation and feedback.

5.4. Professional Development

Principal component analysis (varimax rotation) identified three factors explaining 57.69% of the total variance (global α = 0.84). Factor 1: collaborative supervision focused on resource sharing, explaining 35.72% of the variance: actions to disseminate and pool resources.

Factor 2: strategic supervision of professional development, explaining 21.97% of the variance: strategic planning and alignment of PD with school objectives, as well as monitoring of implementation.

Table 2. Rotation of the component matrix of the DP.

Professional Development	Factorial Axes		
	Fact 1	Fact 2	Fact 3
1) Selects continuing education activities that align with the school's academic objectives.		0.576	0.558
2) Supports training requests that are directly related to the school's academic objectives.			0.787
3) Informs teachers about professional development opportunities.	0.544		0.558
4) Distributes journal articles to teachers.	0.919		
5) Arranges for external speakers to give presentations on teaching during faculty meetings.	0.754		
6) Encourages teachers to apply skills acquired in professional development courses in their classrooms.		0.681	
7) Schedules individual meetings to discuss teaching-related issues with teachers.			0.784
8) Attends teachers' professional development activities.		0.760	
9) Allocates time during faculty meetings to discuss teaching and professional development activities.		0.853	

Factor 3: directive supervision, explaining a smaller proportion of the variance (residual variance), characterized by lesser homogeneity: more directive and individualized actions. Given more diffuse saturations and the small sample size, interpretation should remain cautious. Overall, PD combines collaborative resource sharing, strategically aligned training engineering, and more directive modalities, with satisfactory internal consistency (Table 2).

5.5. Personal, Professional, and Collective Self-Efficacy

5.5.1. External and Internal Personal Self-Efficacy (SEPE and SEPeI)

Exploratory factor analysis reveals that external personal self-efficacy (SEPE) is organized around two complementary dimensions: 1) the mobilization of institutional and organizational resources, and 2) direct intervention in professional situations. The obtained structure explains more than 56% of the total variance and presents satisfactory reliability indices. At the same time, internal personal self-efficacy (SEPeI) is divided into two distinct factors accounting for nearly 68% of the variance, confirming the psychometric soundness of the construct.

5.5.2. Internal and External Professional Self-Efficacy (IPSE and EPSE)

Factor analysis of SEProI reveals a two-dimensional structure: 1) the ability to adapt and be flexible, and 2) the ability to clarify and direct educational objectives. These two factors explain more than 66% of the variance and show excellent reliability coefficients. Regarding SEProE, three dimensions emerge: institutional support, instructional planning, and interactive support. They explain 64% of the total variance and present satisfactory reliability.

5.5.3. Internal and External Collective Self-Efficacy (ICSE and ECSE)

Analysis of SECi highlights three factors reflecting professional cooperation, shared leadership, and collective autonomy. Together, they explain nearly 69% of the variance. Similarly, SECe presents a three-factor structure based on five items, oriented towards professional collaboration and democratic leadership, also explaining nearly 69% of the variance.

A t-test for independent samples from Table 3 was conducted to explore differences in supervision practices based on the administrative status of the supervisor (director and head of studies). The results reveal no statistically significant difference between the two groups for all the variables measured, and the effect sizes were all small to moderate (d ranging from 0.05 to 0.41), suggesting that administrative status does not have a notable influence on supervision practices.

Regarding the supervision model, no significant differences were observed for clinical supervision, $t(35) = -0.76$, $p = 0.45$, $d = 0.26$, nor for peer supervision, $t(35) = -0.82$, $p = 0.42$, $d = 0.27$. These values correspond to small effects. Concerning the supervision phases, the analyses revealed non-significant differences for the pre-supervision phase, $t(35) = 0.13$, $p = 0.90$, $d = 0.05$, for the supervision phase, $t(35) = 1.22$, $p = 0.23$, $d = 0.41$, and for the post-supervision phase, $t(35) = -0.67$, $p = 0.51$, $d = 0.23$. The most substantial effect observed concerned the su-

pervision phase, although it remains moderate in size and non-significant. As for professional development, the differences were not significant for the directive approach, $t(35) = -1.01$, $p = 0.32$, $d = 0.34$, nor for the collaborative approach, $t(35) = -0.14$, $p = 0.89$, $d = 0.05$.

The administrative status (director and head of studies) does not appear to significantly influence supervision practices, whether in terms of the model used, the supervision phases, or the professional development approaches. The small to moderate effect sizes corroborate that these differences are minimal in practical terms.

Table 3. T-test for independent samples: administrative status of the supervisor.

Independent Variables	Director (N = 18)		Dean of Studies (N = 19)		T	df	*P* value	d de Cohen
	M	SD	M	SD				
Supervision Model								
Clinical	4.07	0.92	4.31	0.95	−0.76	**35**	**0.45**	**0.26**
Peer	4.02	0.89	4.25	0.83	−0.82	**35**	**0.42**	**0.27**
Supervision Phase								
Pre-Supervision Phase	3.49	1.62	3.42	1.38	0.13	**35**	**0.90**	**0.05**
During-Supervision Phase	4.36	1.35	3.74	1.72	1.22	**35**	**0.23**	**0.41**
Post-Supervision Phase	5.24	0.76	5.42	0.84	−0.67	**35**	**0.51**	**0.23**
Professional Development								
Directive	3.85	1.26	4.29	1.38	−1.01	**35**	**0.32**	**0.34**
Collaborative	4.79	0.90	4.84	1.20	−0.14	**35**	**0.89**	**0.05**

Note. d = Cohen's d.

The results presented in Table 4 highlight the disparities in supervision practices exercised by supervisors, depending on the status of the institution (private, public and publicly funded). In order to explore these differences, one-way analysis of variance (ANOVA) was conducted for each of the dimensions examined. Effect sizes were evaluated using η^2. Given the disparity in group sizes, multiple comparisons were made using the Games-Howell post-hoc test when the overall effect was found to be significant.

The distinctions in supervision practices based on the status of the institution (private, public and publicly funded) were analyzed using one-way analysis of variance. Effect sizes were evaluated using Eta-squared (η^2). Given the unequal group sizes, multiple comparisons were made via the Games-Howell post-hoc test when the overall effect was found to be significant.

Table 4. Supervision practices (of supervisors) according to the status of the establishment.

Independent variables	Private (N = 2)		Public (N = 20)		Publicly funded (N = 15)		F	*P*_value
	M	SD	M	SD	M	SD		
Supervision Model								
Clinical Supervision	3.03	0.05	4.13	0.90	4.44	0.93	**2.25**	**0.12**
Peer	3.20	0.00	4.28	0.90	4.08	0.80	**1.56**	**0.22**
Supervision phase								
Pre-Supervision Phase	2.38	0.18	3.50	1.48	3.53	1.57	**0.55**	**0.58**
During-Supervision Phase	2.75	0.35	3.85	1.71	4.47	1.34	**1.42**	**0.25**
Post-Supervision Phase	3.90	0.14	5.52	0.68	5.28	0.80	**4.61**	**0.02**
Professional Development								
Directive	3.00	0.47	4.28	1.36	3.96	1.32	**0.95**	**0.40**
Collaborative	3.88	0.53	4.93	0.94	4.80	1.21	**0.91**	**0.41**

The results reveal that no statistically significant difference was found between the groups regarding the clinical supervision model, $F(2, 34) = 2.25$, $p = 0.12$, $\eta^2 = 0.12$, or for peer supervision, $F(2, 34) = 1.56$, $p = 0.22$, $\eta^2 = 0.08$. Similarly, no significant difference was observed for the pre-supervision phase, $F(2, 34) = 0.55$, $p = 0.58$, $\eta^2 = 0.03$, or during the supervision phase, $F(2, 34) = 1.42$, $p = 0.25$, $\eta^2 = 0.08$.

However, a significant difference was found for the post-supervision phase, $F(2, 34) = 4.61$, $p = 0.02$, $\eta^2 = 0.21$, indicating a moderate effect size. The post-hoc comparisons made using the Games-Howell test show that supervisors in public institutions (M = 5.52, SD = 0.68) and publicly funded institutions (M = 5.28, SD = 0.80) report higher levels of post-supervision practices compared to those observed in private institutions (M = 3.90, SD = 0.14).

Finally, no statistically significant difference was found for the professional development directive, $F(2, 34) = 0.95$, $p = 0.40$, $\eta^2 = 0.05$, or for collaborative practices, $F(2, 34) = 0.91$, $p = 0.41$, $\eta^2 = 0.05$.

Table 5 illustrates the results of the analysis of variance (ANOVA) conducted to examine disparities in supervisors' supervision practices according to the region of the institution, including effect sizes and post-hoc comparisons made using the Tukey-Kramer procedure. To further interpret the ANOVA results and specify the practical significance of the observed disparities between institution types, we present the post-hoc analyses and the associated effect sizes below. Prior to exploring these additional analyses, an analysis of variance (ANOVA) was conducted to assess the existence of overall disparities in supervisors' supervision practices according to the region of the institution.

Table 5. ANOVA: Supervision practices (of supervisors) by region of establishment.

Independent Variables	Center (N = 10)		East (N = 2)		North (N = 10)		West (N = 9)		South (N = 6)		F	*P* value	η^2
	M	SD	M	SD	M	SD	M	SD	M	SD			
Supervision Model													
Clinical Supervision	3.95	0.90	4.30	0.05	4.59	1.16	4.17	0.75	3.93	0.98	**0.73**	**0.58**	**0.08**
Peer	4.32	0.87	3.30	0.42	4.00	0.72	4.33	1.03	4.07	0.87	**0.77**	**0.56**	**0.09**
Supervision Phase													
Pre-Supervision Phase	3.43	1.25	3.25	0.00	3.40	1.74	3.72	1.79	3.25	1.47	**0.10**	**0.98**	**0.01**
During-Supervision Phase	3.85	1.08	4.50	0.00	4.60	1.79	3.83	1.70	3.58	1.99	**0.54**	**0.71**	**0.06**
Post-Supervision Phase	4.88	0.77	5.40	0.28	5.34	1.12	5.47	0.47	5.87	0.24	**1.67**	**0.18**	**0.17**
Professional Development													
Directive	4.13	1.44	2.75	1.06	4.25	1.50	3.96	1.13	4.31	1.30	**0.58**	**0.68**	**0.07**
Collaborative	4.58	1.09	4.38	1.94	5.18	1.23	4.72	0.74	4.92	1.00	**0.51**	**0.73**	**0.06**

Note: η^2 = eta-squared (effect size). Post hoc comparisons were performed using the Tukey-Kramer procedure. which is appropriate when group sizes are unequal.

An analysis of variance (ANOVA) was performed to examine disparities in supervisors' supervision practices according to the region of the institution. The results revealed no statistically significant differences between regions for the various supervision models, supervision phases, and professional development approaches ($p > 0.05$). For example, regarding clinical supervision, the effect of region was found to be non-significant, $F(4, 32) = 0.73$, $p = 0.58$, $\eta^2 = 0.08$, indicating a small effect size. Similarly, no significant differences were observed for peer supervision, $F(4, 32) = 0.77$, $p = 0.56$, $\eta^2 = 0.09$. The analyses related to supervision phases (pre-supervision, ongoing supervision, and post-supervision) also did not reveal a significant effect of region ($p > 0.05$). Finally, the directive and collaborative professional development approaches did not show significant differences according to the region.

Post-hoc comparisons were conducted using the Tukey-Kramer procedure to account for unequal group sizes; no pairwise comparisons reached the threshold of statistical significance.

5.6. Sociocognitive Characteristics

The results presented in Table 6 show that, although supervisors sometimes express an external perception of their self-efficacy (M = 2.20; SD = 1.00) or their professional efficacy (M = 2.28; SD = 1.38), they are more clearly distinguished by a high internal perception of their self-efficacy (M = 4.82; SD = 0.98) and their

professional efficacy (M = 4.99; SD = 0.87). They also display a high internal perception of their communication efficacy (M = 4.92; SD = 0.66) and a significant external perception of collective efficacy (M = 5.00; SD = 0.81), demonstrating a strong confidence in the group's ability to collaborate effectively and achieve common goals.

Table 6. Means. standard deviations and correlations of supervisory practices with selected socio-demographic and socio-professional characteristics and feelings of efficacy.

	M (SD)	Supervision Clinical	Peer Supervision	Pre-Supervision Phase	During-Supervision Phase	Post-Supervision Phase	Directive	Collaborative
Age	43.92 (4.94)	0.043	0.141	−0.082	0.009	0.014	−0.077	0.064
Years of Experience	9.62 (3.24)	0.105	0.176	−0.128	0.055	−0.040	−0.059	0.138
Administrative Status	1.51 (0.51)	0.128	0.137	−0.022	−0.203	0.113	0.168	0.024
SEPeI1	4.82 (0.98)	0.331*	0.251	−0.009	0.222	0.442**	0.118	0.373*
SEPeE1	2.2 (1)	−0.084	−0.124	−0.108	0.191	0.036	−0.014	−0.164
SEProI1	4.99 (0.87)	0.332*	0.188	0.140	0.099	0.445**	0.360*	0.470**
SEProE1	2.28 (1.38)	−0.093	−0.143	−0.261	−0.012	0.116	−0.161	−0.264
SECI1	4.92 (0.66)	0.046	0.140	0.100	−0.037	0.063	0.317*	0.359*
SECE1	5 (0.81)	0.234	0.201	0.151	0.044	0.065	0.147	0.229

Note: ***$p < 0.001$, **$p < 0.01$, *$p < 0.05$. SEPI: Sense of internal personal efficacy; SEPE: Sense of external personal efficacy; SEProI: Sense of internal professional efficacy; SEProE: Sense of external professional efficacy; SECI: Sense of internal collective efficacy; SECE: Sense of external collective efficacy.

The data thus indicate that supervisors have a much more pronounced internal efficacy than their external efficacy, as evidenced by standard deviations between 0.87 and 0.98, compared to 1.00 to 1.38 for external efficacy. Supervisors with high internal efficacy are more invested in clinical supervision and fine-tune their intervention styles more precisely. This profile, marked by a solid professional assurance and a reflective posture, reveals a motivation primarily rooted in internal resources rather than external stimuli.

The analysis of means, standard deviations, and correlations (Table 6) reveals several significant relationships:

- Internal Personal Self-Efficacy (SEPeI) is positively correlated with clinical supervision (r = 0.331; $p < 0.05$), the "during" phase of supervision (r = 0.442; $p < 0.01$), and collaborative supervision (r = 0.373; $p < 0.05$). These results suggest that supervisors feel more competent when they benefit from or implement structured, interactive, and practice-focused supervision.

- Internal Professional Self-Efficacy (SEProI) is significantly associated with clinical supervision (r = 0.332; $p < 0.05$), the "during" phase (r = 0.445; $p < 0.01$), guiding activities (r = 0.360; $p < 0.05$), and collaborative activities (r = 0.470; $p < 0.01$). This indicates that the sense of professional competence strengthens in supervisory setups that balance guidance and collaboration.
- Internal Collective Self-Efficacy (SECi) is positively correlated with guiding activities (r = 0.317; $p < 0.05$) and collaborative activities (r = 0.359; $p < 0.05$), showing that cohesion and shared trust increase when supervision combines structure, participation, and cooperation.

No significant relationship was observed between sociodemographic variables (age, experience, administrative status) and the dimensions of the sense of efficacy. Similarly, external manifestations of perceived efficacy (SEPeE and SEProE) show no significant links with forms of supervision.

6. Discussions

In this context, it is essential to examine the extent of the observed differences and their implications. This approach justifies the integration of an analysis based on effect sizes, while carefully considering the composition of the groups. The statistically significant differences observed appear only during the post-observation phase. To evaluate their practical importance, the overall effect size (η^2p) and the effect sizes calculated using Cohen's η^2, allowing to evaluate the magnitude of the differences beyond the simple statistical significance. However, given the very limited number of private establishments in the sample, these results should be interpreted with caution and require additional confirmation with additional data.

To interpret the differences between the groups, the analysis is based on both statistical significance and the importance of effect sizes. Results with moderate p-values but substantial effect sizes are considered practically relevant, while statistically significant results associated with negligible effects are interpreted with caution. This approach ensures that the conclusions reflect both the statistical reliability and the practical relevance of the results.

6.1. Supervision Models

The results show that supervisors mainly use the clinical supervision model, confirmed by factor analysis and acceptable levels of internal consistency. In line with Hair et al.'s (2010) recommendations, which suggest a Cronbach's alpha of at least .60 is acceptable in the exploratory phase and at least .70 in the confirmatory phase, the identified factors have satisfactory reliability. The predominance of the clinical model is consistent with the work of Hargreaves & Fullan (2012) and Avalos (2011), who emphasize that clinical supervision promotes reflective analysis, co-construction of solutions, and professional development of teachers.

6.2. Supervision Phases

The analysis highlights two essential phases: 1) a planning phase prior to the ob-

servation and 2) a feedback phase following it. During the planning phase, the supervisor and the teacher jointly set the objectives, criteria and observation tools. This approach is fully in line with the contributions of Robinson (2017), according to which the improvement of educational practices is based on a clearly defined focus on goals and on deliberately designed actions to support student learning. More specifically, the prior formulation of explicit expectations helps to limit the dispersion of practices and to refocus all efforts on essential dimensions of teaching.

6.3. Professional Development

The factor analysis highlights three factors that account for about 78% of the variance: Support for PD (34.6%, $\alpha = 0.85$), Information and communication (23.1%, $\alpha = 0.73$) and Orientation and support (20.3%, $\alpha = 0.69$). These results, attesting to satisfactory consistency, particularly through the parallelism between the structure of the factors and their contribution, confirm the central role of supervisors in the professional development (PD) of teachers. They are consistent with the work of Darling-Hammond et al. (2017), which shows that effective professional development is based on a set of structuring conditions, including continuous support, collaboration, explicit communication of expectations, and support for teachers in their practices.

6.4. Characteristics of Supervisors and Supervision Practices

The results highlight that the sociocognitive dimensions, particularly attitudes, motivations and perceptions of efficacy, have a significant influence on supervision practices. This interpretation is consistent with that of Lozano et al. (2025), who show that the collective efficacy of teachers, combined with various socio-cognitive factors, significantly determines professional practices. Moreover, DeWitt (2017) emphasizes that when teachers consider their supervisory team to be both benevolent and competent, their perception of the learning environment is significantly improved.

6.5. Age and Experience

The average age of supervisors (43.92 years) and their years of experience (9.62 years) indicate a relatively experienced population. Although age is not significantly correlated with dimensions of self-efficacy, professional experience remains an important factor. These findings are consistent with Kim & Lee (2020), as well as with Darling-Hammond, Hyler et Gardner (2017) and Dumont & Istance (2019), who show that more experienced supervisors tend to develop a more positive perception of their professional efficacy.

6.6. Administrative Status

Supervisors with a higher administrative status have higher levels of internal and external professional self-efficacy (note: two explicitly named dimensions). This

corroborates Timperley (2011) and Glickman et al. (2014), who emphasize that hierarchical responsibilities can reinforce the perception of professional competence. These results suggest that training programs should take into account the specific needs of supervisors in administrative positions, in line with Dumont & Istance (2019).

6.7. External and Internal Self-Efficacy (SEPE and SEPeI)

Supervisors with strong internal personal self-efficacy are more involved in clinical supervision, particularly upstream of observation. This perceived efficacy promotes initiative, engagement in continuing education and the quality of feedback (Glickman et al., 2014; Dumont & Istance, 2019). These observations corroborate Timperley (2011), who argue that professional confidence is a major lever for improving practices. The statistical analysis confirms that these dimensions explain a significant portion of the observed variance. Zhang et al. (2025) also emphasize the role of institutional leadership in maintaining a climate conducive to personal efficacy.

6.8. Perception of Internal and External Professional Self-Efficacy (SEProI and SEProE)

The SEProI plays a decisive role in animating supervisory engagement, facilitating decision-making, and structuring clinical approaches. It is part of the perspective of Timperley (2011), who emphasizes the importance of reflective practices and the development of professional skills in the progression of teachers. Moreover, the perceived professional recognition, whether it comes from peers or hierarchical superiors, is a central lever for strengthening the sense of professional efficacy (Glickman et al., 2014). Conversely, its absence is likely to erode motivation and compromise engagement, as evidenced by Lessard and Tardif (2004). Furthermore, the SEProE is based on the quality of institutional support, the rigor of planning, and the richness of professional interactions. The articulation of these components promotes the emergence of a framework conducive to continuous learning. In this logic, shared leadership and collaboration contribute to supporting the empowerment of educational actors and to consolidating their involvement (Hargreaves & O'Connor, 2012; Harris, 2020).

6.9. External and Internal Collective Self-Efficacy (SECe and SECi)

Three factors, shared leadership, professional collaboration and autonomy, explain 68.9% of the variance in the sense of collective efficacy. This structure is consistent with Bandura (1997), for whom collective efficacy is based on coordination and the shared conviction that the group can achieve its goals. These results are also in line with Knickenberg et al., (2025) and Tschannen-Moran (2014), who emphasize the role of collaboration and interpersonal trust.

Distributed leadership appears to be a central lever (Spillane, 2006; Leithwood et al., 2004), reinforced by World Bank (2022), which associate decision-making

autonomy and team cohesion. Finally, this dynamic is in line with the approaches to sustainable professional development (Hargreaves & Fullan, 2012), supported by learning communities (Harris, 2020).

6.10. Limits of Study

Despite the scientific and practical interest of the results obtained, the present research has several limitations that call for a cautious interpretation of the conclusions. First, the small size of the sample and the use of non-probabilistic intentional sampling restrict the generalization of the results to the whole of the Burundian school contexts, with some regions or categories of establishments being at risk of being underrepresented.

Secondly, data collection based exclusively on a self-assessment questionnaire exposes the study to biases of social desirability and perception, without the possibility of triangulation through observations or interviews. Moreover, although the statistical analyses used (exploratory factor analyses, correlations, t-tests, ANOVA) make it possible to identify associations, they cannot establish causal relationships. The sample size could also have influenced the stability of the extracted factors and the detection of low-amplitude effects. Finally, the absence of a qualitative approach limits the in-depth understanding of the mechanisms and contextual dynamics underlying the practices of pedagogical supervision.

6.11. Future Research Directions

In light of the methodological and empirical limitations identified, several research perspectives merit consideration to deepen the analysis of pedagogical supervision in Burundian secondary education. First, it would be relevant to conduct larger-scale studies, based on probabilistic sampling and larger samples, to strengthen statistical power, the robustness of factorial structures, and the scope of generalizations to all school contexts.

Moreover, the adoption of mixed designs combining standardized quantitative instruments and qualitative approaches (interviews, in-situ observations, focus groups) would allow for data triangulation and a more fine-grained understanding of the mechanisms linking supervision practices to the actors' sense of efficacy. Longitudinal or quasi-experimental research could also examine the evolution of practices over time and analyze the effect of targeted training programs on the different phases of supervision and on perceived forms of effectiveness.

Finally, the study of organizational and contextual factors, as well as regional comparisons or focused on specific sub-populations, would help to better identify the conditions for implementing formative supervision adapted to local realities and to guide evidence-based professional development policies.

7. Conclusion

This study aimed to examine instructional supervision practices in Burundian secondary education and their relationship with supervisors' self-efficacy. The results

show a predominance of the clinical model, as well as a determining role of the supervision phases, planning, observation, feedback, follow-up, in trainer support. The individual characteristics of the supervisors (status, experience, perceived efficacy) influence their practices and their support capacity.

Scientifically, this study contributes to documenting supervision in a still little-studied context. Practically, it invites decision-makers to strengthen the training of supervisors, particularly in terms of feedback, collaboration and shared leadership. Finally, this research opens up perspectives for the study of organizational conditions likely to improve the quality of supervision and, by extension, that of teaching.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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