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Teachers' views about the effectiveness of short visits on their instructional performances

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Teachers' Views about the Effectiveness of Short Visits on their Instructional Performance

A Thesis Submitted by

Gelan Hesham Abdou Ahmed

Submitted to the Department of International & Comparative Education

May 2020

In partial fulfillment of the requirements for
The degree of Master of Arts
in Educational Leadership
has been approved by

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The American University in Cairo

Graduate School of Education

TEACHERS' VIEWS ABOUT THE EFFECTIVENESS OF SHORT VISITS ON THEIR INSTRUCTIONAL PERFORMANCE

A Thesis Submitted to

The Department of International & Comparative Education

in partial fulfillment of the requirements for

the degree of Master of Arts in Educational Leadership

by

Gelan Hesham Abdou Ahmed Mahmoud

under the supervision of

Dr. Thomas DeVere Wolsey

May 2020

Abstract

Supervisors from the Central science, technology, engineering, and mathematics (STEM) Unit conduct unannounced classroom observations to ameliorate the quality of teaching and learning inside public STEM schools. After conducting several classroom visits, supervisors posited that teachers integrate instructional methodologies that reinforce low-order thinking skills and rote memorization of facts (World Bank, 2017). Thus, the aim of this quantitative study is to describe teachers' views about the effectiveness of short visits on their instructional performances. Sixty-four teachers were conveniently selected from three public Egyptian STEM schools, located in Giza, Cairo, and Qalyubia governorates and were requested to complete a 5-point Likert survey, involving twenty statements, adapted from Kubicek's Classroom Walkthrough Observation Process Model (2015). As a result, the data obtained from the research participants suggested that the short visits' model has a positive effect on teachers' instructional performances at one of the three schools. However, the short visits' model has been perceived by STEM teachers at two schools to have a minimal impact on their instructional performances, since it lacks improvement plans, follow-ups, and resources. Last, recommendations for future research and implications for teachers were developed based on the study's results.

Keywords: STEM schools, short visits, instructional performances, and teaching and learning

Table of Contents

Chapter 1: Introduction

Short visits are brief, unannounced classroom observations, lasting up to 30 minutes. These visits, which focus on aspects, like classroom management, transitions between class activities, and instructional pedagogies, are one aspect of informal supervision (Kramer, 2007; Nolan & Hoover, 2010; Watters, 2017).

Short visits, which are also referred to as walkthroughs, mini-observations, quick visits, instructional walks, classroom walkthroughs, and instructionally-focused walkthroughs, are regarded as a process of visiting "classrooms for a brief time period of 5 to 30 minutes where the instructional program is observed, data is gathered, and feedback is provided to teachers" to improve their instructional performances (Kachur et al., 2013, p. 2).

Instructional performance is deemed as a process, in which teachers utilize a wide variety of instructional practices to improve students' retention of knowledge, boost their participation, deepen their learning and comprehension, and foster collaboration (Qureshi & Niazi, 2012). In fact, teachers' instructional performance is associated with certain positive behaviors, including creating a safe learning environment, building trust, being prepared for classes, incorporating varied instructional strategies, mastering the subject matter, catering for students' individual differences, fostering self-regulation, being dedicated to their profession, and managing classrooms (Gordon, 2012; Habib, 2017).

The theoretical model, which is incorporated in the current study, is Kubicek's Classroom Walkthrough Observation Process (2015). It explains how walkthroughs improve instruction, and it encompasses three, essential sections:

(a) Gather, clarify, and reflect on evidence,

(b) Provide resources and support, and

(c) Promote deliberate practice.

To begin, section (a) deals with collecting evidence regarding teachers' instructional strategies during classroom walkthroughs and providing them with precise feedback during post-observation conferences. Next, section (b) emphasizes aligning resources and professional development for teachers about the incorporation of new instructional techniques. Last, section (c) aims at encouraging teachers to continue using

effective instructional practices, which were incorporated during classroom walkthroughs.

This chapter includes the key sections below:

(a) Background on Short Visits,

(b) Statement of the Problem,

(c) Importance of the Study,

(d) Research Question and Sub-Questions, and

(e) Theoretical Model.

Five chapters, references, and appendices are included in the thesis. Chapter 1 presented a general overview of the statement of the problem, importance of the study, research question and sub-questions, and theoretical model. Chapter 2 epitomized the relevant literature on short visits and teachers' instructional performance. Chapter 3 underlined the research methodology; it described the research design, target population, schools, data collection tool, data collection procedures, validity and reliability, data analysis, ethical considerations, and delimitations. Chapter 4 entailed the study's results; the surveys' results were analyzed descriptively. Chapter 5 encompassed recommendations for future research and implications for teachers. Further, it discussed the investigated issue, theoretical model, research question, research design, and results of the study.

Background on Short Visits

Short Visits

Peters and Waterman (1982) published a business book, called *Search for Excellence: Lessons from America's Best-run Companies*. It discussed some of the management techniques, which were being used by successful companies in the US. One of these techniques is visible management. Later on, visible management was adapted and introduced to the world of education and became known as short visits. Conducted by either supervisors or schools' principals, short visits aim at evaluating teachers' classroom practices and arranging professional development opportunities (Kachur et al., 2013).

Models of Short Visits

A number of models for short visits came upon the scene, such as the Learning Walk, the School Management Program, Teachscape Classroom Walk Through, the Process for Advancing Learning Strategies for Success, and the Downey Three-Minute Classroom Walk Through (Boothe, 2013).

The Learning Walk Model

The Learning Walk Model was developed at the Institute for Learning at Pittsburg University. This model which aims at assessing teachers' instructional practices without any evaluative intent entails three, central features: focus, observation, and feedback (Briggs, 1984; Gallacher, 2014; Njeru, 2016; Snow, 2014). Supervisors, prior to conducting learning walks, determine the focus of classroom observations. Once the focus is established, supervisors spend around 20 minutes observing teachers in action. Later on, supervisors provide teachers with accurate, constructive feedback about their performances during classroom observations.

School Management Program (SMP)

Having no evaluative intents, the SMP model aids teachers in responding to their own queries about their practices and effectiveness. It involves three, key stages: look for, feedback, and professional development (Watkins, 2011). Unlike the aforementioned model, schools that incorporate the SMP model allow their teachers to select the focus for classroom observations. Then, based on the data collected during classroom observations, supervisors provide teachers with meaningful feedback. Last, teachers are not only provided with the needed aid and resources but also provided with professional development opportunities to remedy their weaknesses.

Teachscape Classroom Walk Through (CWT)

The Teachscape CWT model is concerned with classroom practices, which impact students' achievement. It comprises three, fundamental facets: focus, feedback, and professional development (Mette et al., 2015). First, since this model focuses on boosting pupils' academic achievement, the focus for classroom observations lies in critical instructional techniques that are being employed inside classrooms, such as cooperative learning and differentiated instruction. Second, supervisors provide teachers

with feedback based on the data collected during class observations. Finally, supervisors tenaciously arrange for professional development opportunities that align with teachers' needs.

Process for Advancing Learning Strategies for Success (PALSS)

The PALSS model, developed in 1976 by James Evans, focuses on advancing teachers' competencies and aptitudes (Watkins, 2011). It encompasses three, central elements: observation, feedback, and professional development. First, classroom observations are conducted methodically to assess teachers' instructional pedagogies. Second, constructive feedback is provided to teachers regarding their instructional methods and strategies. Finally, supervisors arrange professional development opportunities for teachers in regard to the implementation of research-based instructional methodologies (Boothe, 2013; Kachur et al., 2013).

The Downey Three-Minute Classroom Walk Through (CWT)

The Downey Three-Minute CWT focuses on providing teachers with meaningful, accurate feedback to improve their instruction (Rizzo, 2004). It consists of three, key characteristics: observations, feedback, and reflective dialogues. First, classroom observations, in this model, are brief visits that last up to 20 minutes and focus on two main aspects: instruction and curriculum. Second, after conducting classroom observations, supervisors review the collected data with teachers and provide them with precise feedback. Last, teachers are given many opportunities to contemplate the collected data and propose ways with which they can enhance their performances inside the classrooms.

Short Visits' Model in Egyptian STEM Schools

In STEM schools, short visits are conducted to enrich the quality of teaching and learning and ensuring teachers' alignment with schools' mission. Having no evaluative intent, these visits are brief, unannounced classroom observations that are principally conducted by supervisors from the MoE. This particular model of short visits involves three, essential phases: focus, class observations, and feedback. First, unlike the SMP model, supervisors are the ones who select the focus for classroom observations, not teachers; the focus for classroom observations in STEM schools targets three, important aspects: classroom management, syllabi, and instructional strategies. Second, during

classroom observations that last for 20 minutes, supervisors collect evidence about the selected focus using an instrument. Finally, supervisors meet individually with teachers to provide them with feedback (A. Kamoun, personal communication, October 7, 2019).

Advantages of Short Visits

Short visits have been attested to positively affect schools, teachers, and educational supervisors (Poston et al., 2004). First, educational institutions can pinpoint teachers' professional development needs, disseminate novel teaching techniques and best practices, and collect data on student learning and academic achievement. Second, short visits empower teachers to recognize their points of weakness and strength, contemplate their teaching techniques, and take part in valuable communities of practice. Third, short visits enable supervisors to build rapport with teachers, monitor students' performance, remedy teachers' points of weakness, and be well-aware of what is taking place inside classrooms (Abera, 2017; Zepeda, 2009).

Components of Short Visits

To harness the aforementioned advantages of short visits, certain elements must be in place. These elements encompass protocols, focus, data-gathering tools, and feedback (Poston et al., 2004). First, protocols include the frequency of the short visits and their durations; most commonly, short visits are conducted thrice a month and last up to 30 minutes. Second, supervisors must select a focus area prior to conducting short visits; focus areas may entail teaching effectiveness, classroom management, learning styles, learning environment, technology integration, student engagement, assessments, and differentiated teaching. Third, there are disparate data-gathering tools, such as checklists and rubrics, to be utilized during the short visits to record data. However, the selected tool must align with the focus area of the short visit. Finally, supervisors, after conducting short visits, share the collected data with the teachers to celebrate their strengths, pinpoint their weaknesses, and set goals to remedy them (Poston et al., 2004).

Guidelines for Short Visits

There are several guidelines to be abided by when conducting short visits (Zepeda, 2009). To further explain, supervisors are encouraged to sit at the front corner of the classroom to be able to see students' faces and monitor their interactions with the teacher. Also, if supervisors intend to interview students during their short visit, then they

need to inform the teachers in advance. Moreover, if a group of observers is conducting short visits together, they are discouraged to dialogue with one another so as not to disrupt students' focus and concentration. Last, supervisors are encouraged not to make any judgmental comments while collecting data and are advised to provide teachers with accurate, constructive feedback.

Statement of the Problem

STEM schools' mission is to equip learners with 21st century skills, such as cooperation, communication, creativity, and critical thinking through project-based learning (PBL) (MoE, 2009). PBL is a student-centered strategy, in which pupils thoroughly investigate and address an authentic issue or challenge for an extended period of time (Johnson & Johnson, 2006). Recent research has demonstrated the advantages of incorporating PBL in STEM education; this strategy has been attested to develop learners' cognitive growth, ignite their motivation, augment their collaboration, adjust their understanding and retention, foster their self-esteem, upgrade their problem-solving skills, skyrocket their achievement, enhance their academic repertoire and language acquisition, spark discussions, nurture creativity, accommodate individual differences, and reinforce meticulousness (Coates & Mayfeld, 2009; Li & Lam, 2013; Siegel, 2010).

To guarantee that STEM teachers are working towards accomplishing schools' missions using PBL, supervisors from the MoE's Central STEM Unit conduct unannounced classroom visits. As a result, MoE supervisors indicated, in a World Bank report (2017), that teachers incorporate instructional pedagogies, which reinforce low-order thinking skills. In addition, Abdelmeguid (2017) unveiled that STEM teachers utilize teacher-centered strategies, which emphasize rote learning and memorization of facts and deemphasize the comprehension of theories. By incorporating teacher-centered pedagogies, STEM students fail to link prior knowledge with new information, recognize misconceptions and learning gaps, examine real-world problems, comprehend concepts deeper, apply novel knowledge to address authentic problems, and acquire fundamental skills, like cooperation, problem-solving, and critical thinking (Iqbal & Ahmad, 2015). Hence, STEM schools are lagging behind their shared mission and are mainly putting their quality of teaching and learning at stake (World Bank, 2016).

It appears that there is no empirical evidence about the instructional effectiveness of the short visits' model, which is being implemented in public STEM schools. Consequently, policymakers and stakeholders are obstructed from identifying and sharing evidence-based proofs to enhance the policies and procedures of the short visits' model, which aim at upgrading STEM teachers' instructional performances. Even though STEM teachers are informally observed by MoE supervisors, they are inclined to "offer poor quality teaching in class by passing on the know-how using memorization" (Abdelmeguid, 2017, p. 90). Hence, it is of fundamental importance to describe teachers' views in relation to the effectiveness of short visits on their instructional performance.

Importance of the Study

This study is important for many reasons. First, it adds to the existing body of literature related to short visits; although numerous studies have been conducted by different countries on short visits (Abera, 2017; Campbell, 2013; Eddings, 2007; Kramer, 2007; Levin et al., 1987; Mette et al., 2015; Moradi et al., 2014; Njeru, 2016; Peplinski, 2000; Pierson, 1993; Range et al., 2013; Snow, 2014; Watters, 2017), it seems that, after carrying out web search using phrases, like short visits and STEM schools in Egypt, unannounced classroom observations and STEM schools in Egypt, and classroom walkthroughs and Egyptian STEM schools, on Google Scholar, Egyptian Knowledge Bank, and AUC Library, studies examining the instructional effectiveness of short visits in Egypt are absent. Hence, this study aimed at addressing this particular gap in the knowledge base. Second, most of the studies on short visits have described supervisors' views only in regard to the effectiveness of short visits on teachers' instructional performance (Kramer, 2007; Levin et al., 1987; Mette et al., 2015; Moradi et al., 2014; Njeru, 2016; Peplinski, 2000; Snow, 2014; Watkin, 2011). Thus, this study addressed this gap in the literature by describing teachers' views about the effectiveness of short visits on their instructional performance. Third, the results of this study might motivate the MoE to invest a portion of its monetary resources in offering professional development for supervisors and STEM teachers and might offer proof to Egyptian stakeholders and policy-makers on how to adjust and enrich the process of short visits in public STEM schools.

Research Question and Sub-Questions

This study seeks to address the following research question and sub-questions in an attempt to describe teachers' views regarding the effectiveness of short visits on their instructional performance at three public STEM schools.

RQ- How do STEM teachers view the effectiveness of short visits on their instructional performance?

Sub-Q1- To what extent do short visits impact STEM teachers' instructional practices?

Sub-Q2- To what extent do STEM teachers perceive that the short visits' model is an effective process for measuring the use of research-based instructional strategies?

Theoretical Model

Kubicek (2015) laid the foundation of the Classroom Walkthrough Observation Process Model; in fact, it establishes the connection between classroom walkthroughs and effective instruction through three, major sections. These sections include: (a) gather, clarify, and reflect on evidence, (b) provide resources and support, and (c) promote deliberate practice. Table 1 provides a brief description of the three, key sections.

Table 1

Classroom Walkthrough Observation Process Model

Sections	Description
Gather, Clarify, and Reflect on Evidence	Collecting evidence regarding teachers' current instructional methods, providing them with exact feedback, and giving them ample opportunities to contemplate it
Provide Resources and Support	Using the evidence collected during classroom walkthroughs to provide teachers with the needed resources and professional development
Promote Deliberate Practice	Encouraging teachers to continue using effective instructional methods which were already in place during classroom walkthroughs

Gather, Clarify, and Reflect on Evidence

During classroom walkthroughs, supervisors collect data regarding teachers' instructional methods which are being implemented inside classrooms. Having gathered data, supervisors provide teachers with precise feedback during post-observation conferences. Then, teachers are given ample chances to contemplate the feedback provided to them either by deciding that an existing instructional technique should be altered or changed, clarifying information to supervisors regarding the observed techniques, or suggesting a novel methodology, which could be incorporated in a particular classroom situation or context (Kubicek, 2015).

Provide Resources and Support

Using the data collected from classroom walkthroughs, supervisors acclaim teachers' strength points and pinpoint their weaknesses. In an attempt to remedy their weaknesses, supervisors provide aid, support, and resources to teachers, and arrange for professional development regarding the implementation of effective instructional strategies that enhance students' academic achievement and learning (Kubicek, 2015).

Promote Deliberate Practice

In post-observation conferences, supervisors applaud teachers' instructional methods which were skillfully utilized during classroom walkthroughs. Also, supervisors encourage teachers to continue incorporating those practices inside the classrooms. As a result, teachers are held accountable to consistently implement those techniques, whenever convenient, during classroom observations (Kubicek, 2015).

Chapter Two: Literature Review

This chapter presents the relevant literature on short visits and teachers' instructional performance. Thus, it is divided into two major sections. The 1st section, titled short visits, discusses four, key ideas:

(a) Roles of supervisors during short visits;

(b) Qualities of diligent supervisors;

(c) Issues facing supervisors while conducting short visits; and

(d) Attributes of STEM teaching and short visits.

The 2nd section, titled instructional performance, tackles three, central ideas:

(a) Effects of short visits on teachers' instructional performance;

(b) Factors affecting teachers' instructional performance; and

(c) Impacts of effective instructional performance on students' academic achievement.

Section One: Short Visits

In this section, the relevant literature on short visits is discussed and is linked to STEM teaching.

Roles of Supervisors during Short Visits

Supervisors, who are deemed as "persons with major responsibilities for increasing the professional skills, through in-service, observation, and growth-evoking feedback" (Rizzo, 2004, p. 32), need to execute their duties effectively to achieve the phenomenal advantages of short visits. These duties primarily encompass motivating teachers, monitoring instruction, providing support and guidance, building trust with teachers, providing feedback, offering supplementary resources, selecting a focus for observation, developing plans for teachers' ongoing growth and development, analyzing the collected data, detecting teachers' points of weakness and strength, nurturing a sense of worth and positive self-esteem, and providing teachers with a supportive environment (Essaoudi et al., 2015; Muttar & Mohamed, 2013; Rizzo, 2004). In addition, supervisors are required to establish credibility and effective communication, assess teachers' conceptual levels and utilize an approach matching them, provide platforms for progression, capitalize on teachers' knowledge and wisdom, monitor the implementation

of school policies, and endorse goal setting and the experimentation of new teaching practices (Mette et al., 2015; Nolan & Hoover, 2010; Peplinski, 2009; Watkins, 2011).

Furthermore, Briggs (1984) has documented additional roles for supervisors. These roles entail disseminating innovative practices, ensuring the implementation of the school syllabus, upgrading teachers' aptitude, aiding teachers in achieving teaching objectives, identifying teachers' diverse needs, providing ongoing support and guidance for the effective use of research-based instructional practices, revising and modifying lesson plans, suggesting supplementary readings and resources, assisting teachers with formative and summative assessments, and aiding teachers with the processes of teaching and learning (Kramer, 2007; Njeru, 2016; Snow, 2014). Additionally, when working with teachers, supervisors must identify learners' needs, listen to the challenges teachers face and resolve them, cooperate with teachers to design strategies to improve classroom management, help teachers integrate knowledge into practice, examine instructional materials for quality, ensure the effective use of technology, and arrange for professional development (Eddings, 2005; Levin et al., 1987; Range et al., 2014).

To sum up, the aforementioned literature highlights the predominant roles of supervisors during short visits. These roles include providing help and guidance, offering supplementary resources, pinpointing teachers' points of weakness and strength, ensuring the effective use of technology, providing teachers with precise feedback, endorsing the implementation of new teaching practices, resolving teachers' onerous challenges and problems, and cooperating with them to design lesson plans and assessments. Although these roles are of central importance to the teaching and learning processes, they cannot be effectively performed unless supervisors possess certain professional and personal qualities.

Qualities of Diligent Supervisors

In an attempt to effectively handle their supervisory duties, supervisors need to have several fundamental qualities (Tesma, 2014). According to Tesma, these important qualities are divided into two, main categories: personal and professional. First, effective supervisors possess positive, personal qualities. They are empathic, genuine, open, respectful, congruent, warm, attentive, positive, optimistic, patient, peaceful, good

listeners, approachable, strong leaders, and understanding (Borders, 1994; Zorga, 2006); thus, these personal traits are deemed as pivotal prowess in supervision. Second, effective supervisors exhibit professional qualities, like offering the desired support, possessing experience and knowledge, evaluating teachers fairly, structuring supervision appropriately, providing clear feedback and guidance, helping teachers feel valued, received and understood, preparing teachers for practical work and duties, adapting to their individual differences, and having access to various supervisory interventions and models (Zorga, 2006).

In addition to Zorga (2006), Tesma (2014) pinpointed that supervisors must be able to motivate teachers, create a feeling of trust in others, and establish harmonious relationships with teachers. Moreover, Borders (1994) stressed the fact that good supervisors are knowledgeable and competent, incorporate a variety of supervisory techniques based on teachers' developmental levels, learning styles and personal qualities, seek continuous growth in supervision through professional development activities, and possess problem- solving skills. Besides, Kune and Rodolfa (2013) underscored that good supervisors establish meaningful relationships with teachers, decrease their work-related stress, enhance their performance and satisfaction, skyrocket their autonomy and empowerment, are open to new ideas, abide by ethical principles and codes of conduct, provide constructive feedback accompanied by help, and possess multi-cultural competencies.

Besides, Dakhiel (2017) pinpointed the personal characteristics of effective supervisors; these characteristics entail their aptitude to create good relationships with teachers and school administrators, and to innovate in supervision. Also, he underscored the professional characteristics of good supervisors; these characteristics include their ability to teach effectively, to confront and resolve problems, to be well-aware of the models and strategies of supervision, to deal with marginal teachers, to be familiar with innovative teaching strategies, to know the concept of practical education and its importance, to keep a vigilant eye on teachers' development, to prepare lesson plans, and to know types of educational means.

Last, Ladany et al. (2013) highlighted the characteristics of supervisors that facilitate teachers' growth. They pinpointed the idea that effective supervisors establish a

friendly relationship with teachers, exhibit empathy and encouragement, promote empowerment, provide detailed, challenging feedback, and possess knowledge and competency. These positive qualities have been proven to augment teachers' development and growth (Borders, 1994; Dakhiel, 2017; Tesma, 2014; Zorga, 2006) and adjust their pedagogical techniques (Kune & Rodolfa, 2013).

In summary, supervisors need to possess positive qualities, which enable them to handle their supervisory duties. These qualities entail establishing harmonious relationships with teachers, offering aid and support to them, providing clear-cut feedback, having access to varied supervisory models, being acquainted with innovative teaching practices, possessing integrity, knowledge, and competency, evaluating teachers fairly, and helping them feel valued. Hence, these positive qualities empower supervisors to perform their duties effectively even when encountering grave issues.

Issues Facing Supervisors While Conducting Short Visits

Supervisors face massive hurdles while conducting short visits (Gentry, 2002). For instance, Ugurlu (2014) launched a study in Turkish primary and secondary schools to reveal the issues faced by supervisors while conducting short visits; therefore, he randomly picked 20 supervisors and interviewed them. After analyzing the data, he categorized supervisors' responses into three themes which are guidance and supervision, psychological problems and supervision, and investigation. First, because of the huge number of teachers and the limited number of supervisors, supervisors do not provide them with the needed help, guidance, and support. Second, supervisors reported that poor communication between them and teachers leads to psychological stress. Third, some supervisors regarded themselves as inspectors; hence negatively impacting teachers' behaviors by turning them into change-resistant agents.

In addition, Nwakpa (2017) initiated a study in public schools in Nigeria to pinpoint the challenges, faced by supervisors. He administered a questionnaire to a sample of 220 supervisors. After analyzing the data, he noticed that supervisors face numerous challenges, such as inadequate facilities for supervision, lack of monetary incentives, inadequate experiences and training in educational supervision, inadequate time for supervising tutors due to administrative burden and the limited number of supervisors in schools, uncooperative attitude of school principals and teachers, and lack

of follow-up. As these issues impinge the quality of teaching and learning in schools, several recommendations were proposed to alter the situation; these recommendations encompass providing supervisors with regular training and professional development activities, motivating supervisors through monetary incentives, ensuring follow-ups for teachers, and unburdening supervisors with unnecessary administrative duties and tasks. So, these recommendations, if put into effect, would ensure that supervisors execute their roles effectively and that teachers receive the needed help and support to provide students with better learning experiences.

Moreover, Badah et al. (2013) launched a study in four, public schools in Jordan to explore the obstacles encountered by supervisors. Hence, they randomly picked a sample of 142 supervisors and distributed a Likert-scale questionnaire to the research participants. After analyzing the data, they revealed the fact that supervisors face severe challenges during short visits; these challenges are incalculably portrayed in the lack of comprehensive supervisory plans, the absence of accurate databases about teachers' training, the inadequate number of supervisors, the limited number of teacher observations because of administrative duties, the limited experience of supervisors in educational supervision, the unfamiliarity of supervisors with recent research, the poor incentives for supervisors, the limited supplies and equipment inside classrooms, the lack of support to supervisors, and the poor budget for supervision.

Furthermore, Carron and Drauwe (1997) elucidated a huge number of obstacles, which face supervisors in developing countries. First, they highlighted that the number of teachers who needs to be supervised has augmented immensely, while the number of supervisors is remarkably low. Although their number cannot keep up with the increasing number of teachers, supervisors are gigantically burdened with administrative duties, which impede them from spending enough time observing teachers in action. Second, with regards to economic means, supervisors are badly paid and are not provided with any means of transportation and travel allowances, because of schools' low budgets. Third, as supervisors are not provided with means of transportation, they refrain from observing teachers who are located in remote areas; thus, these remote schools remain unvisited for a prolonged time. Fourth, although professional development is of fundamental importance to supervisors, especially to novice ones, they seldom receive it;

one reason behind this lack of professional development is the low budget, which is dedicated to supervision in developing countries. Last, the recruitment process for supervisors has been severely criticized; in developing states and countries, experienced teachers tend to be promoted to supervisory positions, based on their seniority and years of experience. However, this process has been proven to destructively impinge teachers' growth and development as "there is a little transfusion of fresh blood into the management body" (p. 35). Hence, novice teachers, who possess fresh, innovative ideas, are bombarded with old fashioned supervisors, who are resistant to their new teaching pedagogies.

Also, Ozdemir and Yirci (2015) initiated a situational analysis study on educational supervision in Turkey to explore the obstacles, encountered by supervisors in public schools. They randomly picked 22 supervisors and interviewed them. After analyzing the data, they discovered that supervisors faced several problems during the process of short visits. To start, they notably complained about the lack of training in educational supervision; this lack has a negative impact on teachers' growth and development. Next, they reported being burdened with administrative tasks, which limit the number of observations for teachers. In addition, they stressed the fact that they rarely provide guidance, help, support, and follow-up, because of their hectic schedules. Afterwards, they underscored the lack of objectivity of some supervisors; several supervisors favor teachers, who have close relationships with and tend to write good reports about them. Finally, they highlighted the fact that they are badly paid and receive no monetary incentives.

Last, John (2011) attempted to explicate the dilemmas, which are faced by supervisors during short visits. This study entailed 64 supervisors from the MoE and was launched at a primary school in Mbooni district. He distributed closed-ended questionnaires to the research participants. Having analyzed the data, he concluded that supervisors face numerous obstacles during supervision. To begin with, 50% of the supervisors indicated that school administrators perceived them negatively which causes psychological distress, 67% stressed that they have not received any training in educational supervision, 80% posited that they do not receive any monetary incentives to motivate them, 72% highlighted that they are prohibited from regularly observing

teachers due to administrative duties, 82% emphasized that their pay is extremely low, and 78% noted that lack of materials and equipment hinders them from carrying out their tasks in an effective manner.

To conclude, the most recurrent issue, facing supervisors while conducting short visits, is being burdened with administrative tasks. Henceforth, these tasks impede supervisors from conducting periodic classroom observations, aiming to aid STEM teachers in accomplishing their challenging duties and tasks, which are attributed to the incorporation of PBL; these duties involve employing appropriate technologies, engaging students in their learning process, utilizing innovative instructional strategies, integrating different syllabi for problem-solving purposes, and promoting problem-solving and critical thinking skills (Kennedy & Odell, 2014).

Attributes of STEM Teaching and Short Visits

The rationale behind focusing on STEM teachers relative to short visits is that STEM teachers are obliged to utilize PBL (Joyce & El Nagdi, 2013). PBL is a student-centered pedagogy "that organizes learning around projects which are based on challenging questions or problems that involve students in design, investigative activities, or problem-solving and give them the opportunity to work relatively autonomously over extended periods of time" (Thomas, 2000, p. 1).

To effectively incorporate PBL in STEM education, STEM teachers, according to El Nagdi et al. (2018), need to engage students in the learning process, offer equitable learning experiences to all pupils, deliver complex notions and concepts to a variety of audience, and cooperate with teachers of other subjects to integrate different syllabi for problem-solving purposes. Additionally, Stohlmann et al. (2012) underscored that STEM teachers need to build on students' prior knowledge, act as learning facilitators, aid them in conducting meaningful research, advance their knowledge through social discourse, and guide them in establishing relationships between notions. Furthermore, Kennedy and Odell (2014) stressed the fact that STEM teachers need to employ appropriate technologies to improve students' learning experiences, incorporate innovative instructional practices that challenge them to invent and innovate, promote problem-solving and critical thinking as means of addressing authentic issues, and provide students with interdisciplinary perspectives about complex notions and concepts.

Accordingly, short visits have a crucial role in developing STEM teachers' capacities and potentials (Kachur et al., 2013). Feedback, which is provided to teachers based on the collected data during classroom observations, endeavors to celebrate their points of strength, and support effective instructional practices and disseminate them to school's communities (Boothe, 2013; Zepeda, 2009). Furthermore, it draws teachers' attention to their points of weakness which might endanger students' learning and academic achievement. Hence, supervisors offer help and support and arrange for professional development opportunities to remedy teachers' areas of concern and skyrocket their instructional performances (Mette et al., 2015).

Section Two: Instructional Performance

In this section, the relevant literature on teachers' instructional performance is presented.

Towards an Interpretation of Instructional Performance

According to Heck (2009), and Strong et al. (2011), performance is an elusive term, especially when relating it to the complex task of instruction. Lewis et al. (1999) indicated that "teaching performance is a complex portent, and there is little consensus on what it is, or how to measure it" (p. 80). Thus, there is an ongoing debate on whether the term 'instructional performance' is to be interpreted with regards to teachers' input, the teaching process, product of teaching, or combination of these components. But, Qureshi and Niazi (2012) were able to provide a comprehensive interpretation of the debatable term; they deemed it as a dynamic process, in which teachers incorporate an array of pedagogical techniques to advance pupils' learning process, cater for their learning differences, and respond to their readiness levels.

Effects of Short Visits on Teachers' Instructional Performance

It appears that there is a lack of research on the effectiveness of short visits on STEM teachers' instructional performances. Yet, there is a plethora of literature, demonstrating the positive impact of short visits on teachers' instructional performances. To begin, Celoski (2018) conducted a study to describe the views of supervisors about the effect of classroom walkthroughs on teachers' instructional performances. He incorporated semi-structured interviews as a means of gathering data from nine former and current supervisors. Having analyzed the data, he categorized supervisors' responses

into four, key themes: length and frequency, data collection, non-evaluative intent, and look-fors. First, the majority of the supervisors underscored the fact that they conducted a 15-20-minute classroom walkthrough and alluded to the pivotal importance of classroom walkthroughs, especially for novice and marginal teachers. Second, all supervisors emphasized on the importance of collecting accurate data during classroom walkthroughs; these data enable teachers to contemplate their current classroom practices to better enhance their teaching performance. Third, the supervisors noted that the aim of classroom walkthroughs is not to catch teachers off-guard but to help them grow professionally. Last, almost all supervisors, during classroom walkthroughs, focused on teachers' instructional methodologies in hopes to gauge the quality of teaching and learning in schools.

Besides, Boothe (2013) launched a study to probe supervisors' perceptions regarding the impacts of walkthroughs on teachers' instructional performances. Accordingly, he utilized a Likert-scale questionnaire to collect data from 340 supervisors. After analyzing the data, he postulated the fact that 92.5% of the supervisors agreed that classroom walkthroughs skyrocket student achievement, 86.8% agreed that classroom walkthroughs improve teachers' instructional pedagogies, 89.6% agreed that walkthroughs are an essential tool to inform professional development decisions, 84.9% agreed that classroom walkthroughs assess the effectiveness of job-embedded professional development, 92% agreed that walkthroughs effectively measure teachers' instructional methods, 83% agreed that walkthroughs aid teachers in utilizing innovative approaches to instruction, 83.6% agreed that walkthroughs aid teachers resolve instructional issues, 83.1% agreed that walkthroughs encourage teachers to adopt a repertoire of teaching strategies, 83.6% agreed that supervisors understand teachers' individual differences and needs, and 87% agreed that walkthroughs assist teachers in the acquisition of various instructional practices and methods.

Also, Ikegbusi and Eziamaka (2016) initiated a study to investigate the effect of classroom walkthroughs on teachers' instructional performances. Henceforth, they incorporated a twelve-item questionnaire that was administered to 900 school teachers in Nigeria. Having analyzed the data, they unveiled that 84% of the teachers agreed that walkthroughs improve their punctuality to classes, 89% agreed that walkthroughs

contribute to their professional growth, 83.3% agreed that walkthroughs equip them with central information for instructional improvement, 78% agreed that walkthroughs entice them to create a healthy atmosphere for teaching, and 69.2% agreed that walkthroughs assist them in the acquisition of instruction. Also, 80% of the teachers agreed that walkthroughs imbibe them with appropriate instructional strategies, 84.7% agreed that walkthroughs help them with curricular and instructional dilemmas, 80.8% agreed that walkthroughs equip them with the knowledge of schools' program studies, 88.4% agreed that supervisors provide them with sources of instructional materials, and 80.4% agreed that supervisors develop teachers' skills for identifying students with impairments. Last, 76.8% of the teachers agreed that supervisors stress on schools' policies and visions, and 80.4% agreed that walkthroughs prevent teachers' unethical conduct.

Moreover, Atkinson and Bolt (2010) conducted a study to examine the impacts of class visits on teachers' performances. Therefore, they made use of a Likert-scale questionnaire as a means of collecting data from 20 teachers. Having analyzed the data, they revealed that 88% of the teachers agreed that feedback is the greatest thing about class visits, 66% agreed that feedback should be provided to them verbally, 100% agreed that class visits should be conducted more frequently, and 77% agreed that their teaching practices have improved thanks to class visits. Besides, 77% of the teachers agreed that external supervisors should conduct class visits, 80% agreed that class visits should remain voluntary, 89% agreed that class visits are the reason behind their instructional effectiveness, 50% agreed that an observation focus should be picked prior to class visits, and 98% agreed that class visits should be conducted regularly in all schools.

Besides, Mpofu (2007) carried out a study to scrutinize the effect of class visits on teachers' performance. He incorporated a Likert-scale questionnaire that was administered to 120 teachers in Harare. After analyzing the data, he highlighted that 86% of the teachers agreed that class visits aim at advancing learning and instructional methodologies, 82% agreed that class visits are centered on teaching and learning in schools, 58% agreed that supervisors must possess Bachelor degrees in Education, 87% agreed that class visits assist them and improve student learning, and 56% agreed to be supervised by the heads of their department. Moreover, 48% of the teachers agreed that supervisors should have more than 6 years of experience in teaching in schools, 57%

agreed that they are being supervised once a semester, 73% agreed that they are not daunted by supervisors' presences in classrooms, 75% agreed that they are provided with feedback after class visits, 93% agreed that they rectify their instruction to match supervisors' comments, 94% are content with the class visits' system, and 93% agreed that class visits are of pivotal help to them.

Additionally, Widodo et al. (2011) launched a study to inspect the effect of class visits on science teachers' performance. Hence, they integrated interviews to collect data from ten science instructors in Bandungan. Having analyzed the data, they categorized teachers' responses into two pivotal themes: frequency and instructional competencies. First, science teachers were tremendously content with the class visits conducted by their school principal twice per semester; however, they posited that the school principal should conduct these visits more periodically. Second, science teachers noted a drastic improvement in their instruction thanks to class visits; science teachers, prior to class visits, taught their lessons while sitting and using direct instruction. Yet after being provided with feedback, they began to start their classes on time, stand while teaching their lessons, and rotate around the students while working on disparate activities. Furthermore, they began to integrate different instructional techniques in hopes to respond to students' individual differences and learning needs. Also, they started to integrate technology while explaining new concepts to their students. Finally, science teachers were more familiar with the know-how of designing interactive activities, and formative and summative assessments.

In addition, Campbell (2013) carried out a study to investigate teachers' perceptions regarding the effect of class visits on teachers' instructional performances. So, she conducted semi-structured interviews with ten teachers at a public school. After analyzing the data, she categorized teachers' responses into three, pivotal themes: the relationship between teachers and supervisors, feedback, and lower stress. To start, teachers noted that they developed stronger relationships with their supervisors because of frequent class visits and face-to-face conversations. Besides, amidst face-to-face conversations, occurring after class visits and focusing on new instructional methods, both parties worked on reinforcing authentic and cooperative relationships. Next, teachers regarded supervisors' feedback as an important factor in classroom visits, for it

encouraged them to think deeply about their pedagogical methods and students' learning needs. Also, they applied the necessary changes in their instruction to augment students' learning and achievement. Last, teachers admitted not being intimidated by classroom visits because of three, core reasons. First, supervisors were keen on providing teachers with constructive feedback right after class visits. Second, teachers were less stressed with class visits, because of their frequency; they reported being observed ten times per semester. Finally, teachers perceived supervisors as coaches, rather than evaluators, because of their reciprocal trust.

Furthermore, Levin et al. (1987) launched a study to examine the impacts of classroom visits on teachers' instructional performance. Consequently, they made use of a Likert-scale questionnaire to collect data from 449 teachers in the USA. After analyzing the data, they postulated that 14% of the teachers agreed that they should be observed unexpectedly, 26% agreed that unexpected class visits show their genuine performance, 20.6% agreed that they should be aware of the observation criteria, 23% agreed that they worry about the consequences of getting low ratings by supervisors, and 90% agreed that they change their teaching methods to match supervisors' feedback. Also, 82% of the teachers agreed that supervisors' feedback boosts their teaching performances, 26.5% agreed that supervisors do not challenge them, 14.7% agreed that they study the feedback report carefully, 92% agreed that classroom visits are an important instrument for teachers, and 80% agreed that class visits advance their instructional pedagogies.

Further, Moradi et al. (2014) initiated a study to inspect the effect of classroom visits on English teachers' performance. So, they used a Likert-scale questionnaire, which was administered to 34 teachers in Iran. Having analyzed the data, they disclosed that 95% of the teachers agreed that class visits guide them in solving instructional dilemmas, 80% agreed that class visits increase their teaching skills and practices, 68% agreed that class visits help them know their shortcomings and improve them, 8.1% agreed that class visits damage their effectiveness, and 92% agreed that class visits help them overcome teaching problems. Moreover, 53% of the teachers agreed that class visits skyrocket their morale, 84% agreed that class visits contribute to their professional development and growth, 17.6% agreed that class visits are for paperwork formalities, 58.8% agreed that class visits are vital for inexperienced teachers, and 62.1% agreed that class visits are

necessary for teachers. Last, 8% of the teachers agree that class visits put them under pressure, 14.7% agreed that class visits are done with the aim of control, 11.8% agreed that they follow their styles of teaching and ignore supervisors' remarks, 8% agreed that they are provided with shallow feedback, and 14.8% agreed that class visits are an authoritative process, rather than a democratic and collaborative one.

Moreover, Mette et al. (2015) launched a study to survey principals' perceptions regarding the impacts of class visits on teachers' performances. Data were collected from 74 US school principals via an online questionnaire. Having analyzed the data, they stressed the fact that 84% of the principals agreed that they dialogue with teachers about varied methods of assessing students' knowledge, 84.3% agreed that they discuss possible methods of engaging students, 83.9% agreed that they check the lesson's objectives before class visits, and 82.2% agreed that they aid teachers in setting remediation plans for students who struggle with content. Further, 84.6% of the principals agreed that they identify teachers' strength after class visits, 83.7% agreed that they discuss the data collected with teachers after class visits, 83.5% agreed that they support teachers to contemplate their instructional strategies, 83.3% agreed that they alert teachers of their areas of improvement, and 83.4% agreed that they provide teachers with precise feedback.

Also, Rangie et al. (2013) initiated a study to discover teachers' perceptions regarding the impacts of mini-observations on teachers' pedagogical performance. Range et al. integrated a Likert-scale questionnaire as a means of collecting data from 147 teachers in three public schools in the United States of America. After analyzing the data, they adjudged that 81.6% of the teachers agreed that their supervisors provide them with precise and constructive feedback after mini-observations, 82.5% agreed that supervisors provide them with valuable resources to improve their points of weakness, 82.9% agreed that supervisors develop trust with them, 84.9% agreed that supervisors entice them to contemplate the collected data after class visits, and 85.7% agreed that supervisors identify their improvement areas. Moreover, 86.8% of the teachers agreed that supervisors provide them with a copy of observation reports, 90% agreed that supervisors advocate the incorporation of novel instructional methods, 82.4% agreed that supervisors focus on methods of engaging students in classrooms, 85.4% agreed that supervisors

establish rapport with them, and 79.9% agreed that mini-observations are very important for students' achievement.

Moreover, Zamary (2012) launched a study to examine teachers' perceptions regarding the effect of mini-observations on their instructional performances. He integrated questionnaires and focus group interviews to collect data from 70 teachers in public schools, which are located in Western Connecticut. After analyzing the data, he advanced the fact that 85% of the teachers agreed that mini-observations have positively affected their instructional methodologies, 92% agreed that they preferred mini-observations to formal observations, 87% agreed that formal observations are not useful to their instruction in comparison to mini-observations, and 85% agreed that the aspects of mini-observations are helpful to their instruction, compared to formal observations. In addition to the questionnaires' results, he categorized the instructors' responses into four, pivotal themes: observation authenticity, observation frequency, observation feedback, and instruction. First, the teachers posited that mini-observations are authentic and accurately depict what occurs inside classrooms; they added that they cannot put on a good show in front of supervisors, because these observations are unannounced. Second, the teachers alluded to the fruitful advantages of being frequently observed; they postulated that frequent observations enable supervisors to have a holistic picture of their instructional competencies; hence, they applauded the idea of being observed periodically and informally. Third, the teachers adjudged that the most fundamental aspect of mini-observations is the constructive and detailed feedback, which is provided to them by supervisors during the post-observation conferences; they highlighted that they immensely enjoyed the way supervisors encouraged them not only to contemplate the data collected during classroom observations but also to adopt innovative, student-centered methods. Last, the teachers stressed the fact that mini-observations have a main role in enhancing their instructional strategies since they are constantly enticed to contemplate their current practices and to implement innovative pedagogies to skyrocket students' academic achievement.

To sum up, one of the factors, which positively affects teachers' instructional performance, is short visits. This is because of one decisive reason: feedback. Teachers underlined the fact that their instructional performance has improved thanks to the precise

and constructive feedback, provided to them by supervisors during post-observation conferences; in the aforementioned literature, teachers inestimably favored post-observation conferences, for they were encouraged not only to contemplate their current practices but also to incorporate innovative and research-based pedagogical methods in hopes to augment students' learning and academic achievement. Besides feedback, there are additional factors, such as work environment and professional development, which have been attested to affect teachers' instructional performance.

Factors Affecting Teachers' Instructional Performance

There are disparate factors, which impinge teachers' overall instructional performance (Abarro, 2018; Gikunnda, 2016; Korobe, 2018; Nadeem et al., 2011; Subroto, 2013). Hasbay and Altindag (2018) investigated the factors, which affect teachers' instructional performance at a secondary school in Turkey. Accordingly, a seven Likert-scale questionnaire was administered to 103 teachers who were randomly selected from six public schools. After analyzing the data, the researchers unveiled the fact that the work environment, school management, and wage impinge teachers' performance. In an attempt to pinpoint the relationship and the degree between teachers' performance and the aforementioned factors, correlation analysis was run; as a result, Hasbay and Altindag revealed that a healthy work environment and cooperative school management greatly improve teachers' instructional performance, compared to wages. In other words, when teachers are provided with a friendly work environment and are highly supported by schools' management, their performance improves. Yet, the wage factor, despite its fundamental role as a motivator, has a minimal effect on teachers' performance. So, the researchers recommended that schools' management must invest in developing teachers' skills and aptitudes, provide a healthy work environment and promotion opportunities for teachers, and entice teachers' participation in decision-making processes.

In addition, Abarro (2018) examined the factors which impact teachers' instructional performance in the city of Antipolo. Henceforth, a questionnaire was administered to 76 teachers, who were randomly picked from 12 public elementary and 14 secondary schools. Having analyzed the results, he accentuated the fact that there are two central factors, which enhance teachers' instructional performance: professional

development and wage. First, professional development, such as seminars, workshops, and training, which focused on teaching practices and techniques, positively impacted teachers' instructional performance inside classrooms; therefore, he invigorated schools' management to continue providing teachers with professional development because of its fundamental importance in improving teachers' and students' performance. Second, salaries had a domineering impact on teachers' performance despite the fact that Subroto's study (2013) indicated that teachers' wages had a minor impact on their performance; as a result, wages remain a debatable variable when tied to teachers' performances.

Last, a study was launched to identify the factors, which affect teachers' instructional performance in urban and rural areas of Bahawalpur, Pakistan (Nadeem et al., 2011). A Likert-scale survey was used as a means of collecting data from 204 secondary school teachers. Having analyzed the results, the researchers discovered two main factors, which improve teachers' performance: salary and professional development. As a matter of fact, 87% of the teachers stated that salaries have a vital role in improving their satisfaction and performance, and 91% agreed that professional development helps them enhance their instructional practices and pedagogies. Furthermore, the researchers alluded to several factors that negatively impact teachers' performance; these factors involve hectic schedules, hostile work environments, lack of teaching and learning materials, bad condition of school buildings, and lack of cooperation between administrators and teachers.

All in all, professional development venues, such as seminars, conferences, and training, which focus on teaching practices and methods, have been attested to positively affect teachers' instructional performance inside classrooms. These venues push teachers to adopt research-based instructional techniques to cater to students' different learning styles, to communicate complex ideas to a variety of audiences, to facilitate students' learning and comprehension of concepts, and to advance their knowledge. Hence, intensive professional development is a necessary means not only for boosting teachers' instructional performance but also for improving pupils' academic achievement.

Impacts of Effective Instructional Performance on Students' Achievement

According to Kim (2015), a large body of literature has documented a strong positive correlation between teachers' effective instructional performance and students' academic achievement, which is interpreted as "the accomplishment of a given task that is measured against pre-determined standards of accuracy, speed, and wholeness" (Briggs, 2019, p. 2). For instance, a study was launched to inspect the impact of teachers' effective instructional performance on students' academic achievement in mathematics, English, biology, and chemistry in Indonesia (Sirait, 2016). To achieve the aim of the study, Sirait purposefully selected 20 teachers based on their excellent evaluation scores, which measured their pedagogical performance inside the classrooms. In addition to teachers' evaluation scores, he obtained the scores of the students, who were taught by the selected sample of teachers, in schools' national tests, which were administered by the MoE. To establish a relationship between teachers' instructional performance and students' achievement in national exams, regression analysis was run; as a result, he emphasized that there is a strong positive correlation between the independent variable and the dependent variable. Therefore, it can be inferred that teachers' effective instructional performance is a key indicator of students' academic achievement in tests.

In addition to Sirait (2016), Muema et al. (2018) examined the impacts of effective teaching performance on students' academic achievement in mathematics at public secondary schools. Hence, 155 pupils were randomly selected and were divided into an experimental and control group. On one hand, the experimental group's teacher delivered the syllabus using an array of instructional methods along with Information and Communication Technology (ICT). On the other hand, the control group's teacher used a traditional instructional technique while teaching mathematics. At the end of the academic semester, both groups sat for the exact test, and after analyzing the data, the researchers underlined that the experimental group outperformed the control one. Besides, the researchers run a bivariate correlation analysis to establish a relationship between teachers' instructional performance and students' achievement in mathematics. As a result, a vigorous positive correlation between the independent and dependent variables was established.

Last, a study was conducted to investigate the impacts of teachers' effective instructional performance on students' academic achievement at a secondary school in Nigeria (Briggs, 2019). Accordingly, he selected 100 students randomly and divided them into an experimental and control group. The experimental group, on one hand, was taught Business studies using various student-centered strategies. On the other hand, the control group was taught Business studies using teacher-centered methods. At the end of the academic year, both groups sat for the exact exam. Similar to Muema et al. (2018), Briggs, after running correlation analysis, accentuated the fact that the experimental group outperformed the control one. However, this result contradicts Josiah's and Oluwatoyin's study (2017) which adjudged that teachers' instructional performance had a minimal effect on students' academic achievement in English and math in Nigeria. In spite of the contradicting results, effective instructional performance has a predominant impact on pupils' achievement.

To conclude, the aforementioned literature has documented the positive effect of teachers' instructional performance on students' academic achievement; students' academic achievement skyrockets when teachers incorporate various instructional practices to suit different learning styles. Yet, other studies attribute academic achievement to students' intrinsic motivation to learn and succeed (Josiah & Oluwatoyin, 2017).

Chapter 3: Methodology

This chapter presents the study design and research methods.

Research Design

This quantitative study aimed to describe teachers' views in relation to the effectiveness of short visits on their instructional performance in three public STEM schools. Given the aim of the study, a survey research design was selected as the most suitable method. In fact, survey research designs are regarded as "procedures in quantitative research, in which investigators administer a survey to a sample or to the entire population of people to describe the attitudes, opinions, behaviors, or characteristics of the population" (Creswell, 2012, p. 376).

Participants

Out of 75 STEM teachers who currently work at Otis, Ottavia, and Oakley schools (pseudonyms), a total number of 67 teachers represented the sample of the current study; the remaining eight teachers were absent during survey days. Furthermore, the sample of interest was selected through the convenience sampling technique, a non-probability sampling method, with which "the researcher picks the participants because they are available to be studied" (Creswell, 2012, p. 145).

Schools

Otis, Ottavia, and Oakley schools constituted convenience sites, since these schools, although geographically located in three different governorates, are within a reasonable distance to the researcher.

Otis School

Established in 2011 and located in Giza governorate, Otis school is the 1st STEM school to be built in Egypt (Stemegypt, 2012). It is a three-year public high school, which consists of three grade levels: 10, 11, and 12. Otis school for boys enrolls 150 gifted students annually for each grade level. It strives to create well-educated students, who are immensely empowered to resolve the onerous challenges facing Egypt nowadays, promote an environment of cooperation and inquiry, convert STEM students into future leaders, augment their self-motivation, and enable them to independently and analytically question notions and concepts. Accordingly, it provides them with numerous training

opportunities in universities, research centers, companies, labs, and other prominent institutions.

To create a community of learners, researchers, innovators, makers, and technologists, Ahmed Gamal El-deen, the former Minister of Education and the founder of Otis school, yearned to equip the school with cutting-edge labs, like the fabrication lab (Fab Lab); a Fab Lab is an advanced digital manufacturing technology which aims at turning ideas into reality using computer-controlled tools, including 3D printers, laser cutters, and other technological means. By providing students with a Fab Lab, they are vastly enabled to test their capstone projects and to come up with realistic solutions to Egypt's pertinent issues (Stemegypt, 2012).

Similar to other STEM schools, Otis school obliges prospective students to leave their families and reside in the school's hostel among their colleagues; consequently, some of the students may delve deep into cycles of severe depression which can harmfully affect their academic and social lives. That is why Otis school assigns an advisor to a group of students to support them academically, socially, and psychologically. In addition, the advisor is in charge of outlining students' academic progress, guaranteeing a smooth transition to high school, relieving over-stressed students, communicating with parents and school administration, assisting learners in goal setting and post-secondary plans, and ensuring their participation in school activities (Stemegypt, 2012).

Ottavia School

Inaugurated in fall 2012, Ottavia school for girls is located in Cairo governorate. Ottavia school, which accepts the enrollment of 360 talented students each year, is a three-year public high school, consisting of grades 10, 11, and 12; these grade levels are equivalent to 1st, 2nd, and 3rd secondary stages in any public school. It strives to create independent learners, who are technology literate, logical thinkers, inventors, critical thinkers, problem solvers, innovators, and self-reliant through PBL; by integrating PBL, learners are empowered to address the pertinent challenges facing Egypt (STEM Maadi, 2012).

Unlike Otis school, Ottavia school participated in disparate competitions (STEM Maadi, 2012). To name a few, Ottavia school students won the fourth award in Intel

International Science and Engineering fair (ISE), held in Los Angeles, California on the 18th of May 2017. Ottavia school students' project which was cautiously assessed by many professors, researchers, engineers, and scientists tackled algae energy. This international competition, sponsored by the MoE, Intel, IT Blocks, Misr El Kheir Foundation, and U.S Consulate General in Alexandria, enabled the contestants to meet researchers, students, and college graduates from all over the world in an attempt to showcase and present their groundbreaking science projects. Moreover, Ottavia school came second in a competition, organized by the Egyptian Association for French-language Teachers in 2017; this competition sought to advance French language teaching in Egypt, underscore the integration of various instructional methods in teaching French, establish a magazine for French language recognized by the Supreme Council of Culture, and entice instructors and researchers to publish their works.

Ottavia school is adorned with the latest technological equipment (STEM Maadi, 2012). For example, its classrooms are equipped with computers, Internet, smartboards, projectors, and Learning Management Systems (LMS). In addition, Ottavia school possesses a Fab Lab, one of the venues for learning and innovation, which encompasses many machines, including 3D printers, laser cutters, plasma cutters, shopbots, modella, and vinyl cutters; these high-tech machines help students in transforming their projects into reality and piloting their products to propose effective solutions to counteract Egypt's problems.

Oakley School

Oakley school for boys and girls was established in 2018 and is located in El Qalyubia governorate. Similar to Otis and Ottavia schools, Oakley school is a three-year public high school, comprising three grade levels: 10, 11, and 12 and is accredited by the MoE (Stemegypt, 2018). It annually accepts 150 exceptional students for each grade level: 75 boys and 75 girls. Furthermore, Oakley school aims at teaching science and technology to its students using PBL to expand their horizons and enable them to prudently scrutinize and address the country's challenges, which obstruct its development.

Oakley school comprises three, essential structures: a hostel for boys, a hostel for girls, and a building for educational and administrative purposes (Stemegypt, 2018). The

hostels for boys and girls are completely distant from each other and include kitchens, bedrooms, Internet, dining halls, bathrooms, lockers, gym, washing machines, and housekeepers. Besides, the school building which is established for educational and administrative functions involves three stories, each of which involves 6 classrooms; all classrooms are fully equipped with projectors, computers, Internet, LMS, and smartboards to facilitate learning and comprehension. Also, it encompasses an array of labs for languages, physics, chemistry, biology, and computer. Similar to Otis and Ottavia schools, Oakley school has a Fab Lab which helps students in converting their capstone projects into real prototypes.

Similar to Ottavia school, Oakley school has engaged in several onerous competitions (Stemegypt, 2018). For instance, Oakley school students won the gold medal in the International Mathematical Kangaroo, also known as Mathematical Kangaroo, in 2019. This competition, which mainly includes twelve participation levels, ranging from grade 1 to grade 12, takes place annually on the 3rd of March. It is worth mentioning that this competition tests logical combinations using a multiple-choice test, which runs for 75 minutes and entails 30 questions. Likewise, twelve groups from Oakley school were honored for participating in the 1st International Conference for Information Technology (IT) in 2019, held at Misr University of Science and Technology (MUST); this conference provides ample chances for the participants to meet researchers and professors with similar interests in technology, to attend talks on various technical topics, to acquire new skills, and to showcase sundry IT projects.

Data Collection Tool

In this quantitative study, a 5-point Likert survey, ranging from Strongly Agree (SA) to Strongly Disagree (SD), had been created by the researcher. The researcher derived the survey statements from Kubicek's Classroom Walkthrough Observation Process Model (2015). Then, the survey was dispatched to the researcher's thesis advisor who revised it and ensured that the survey did not include any leading questions or redundant statements, that broad concepts were broken down into separate questions, and that the survey statements were relevant to the topic under investigation (T. Wolsey, personal communication, October 25, 2019).

The survey involves two, major sections: demographic data and Kubicek's Classroom Walkthrough Observation Model. To begin, the initial section comprises general demographic questions, such as gender, years of experience, age, subject taught, and highest degree earned. Further, the second section includes twenty statements, adapted from Kubicek's Model (2015) (Appendix A); statements 1 to 4 inquire about the frequency and aim of classroom visits. Next, statements 5 to 11 highlight supervisors' roles during and after classroom observations. Then, statements 12 to 16 describe supervisors' additional roles during post-observation conferences. Last, statements 17 to 20 underscore supervisors' role during follow-ups.

The closed-ended survey was administered face-to-face to the research participants; in a face-to-face survey, "the interviewer is physically present to ask the survey questions and to help the respondents to answer them" (Czaja & Blair, 2014, p. 40). Face-to-face surveys offer several advantages in terms of high response rates, in comparison to electronic and telephone surveys; generating higher response rates is directly linked to the interviewer's presence during the data collection process. Accordingly, the interviewer, as suggested by Fowler (2002), is empowered to motivate the participants to answer the survey and ensures that none of them skip any of the questions.

Procedures for Collecting Data

Data collection procedures are "detailed explanations of how the study [will be] executed" (Creswell, 2012, p. 51). This section is an inclusive guide for researchers, seeking to replicate this study in various contexts.

During Data Collection

After acquiring the IRB and CAPMAS, the researcher visited the three STEM schools during the second semester of the academic year 2019-2020 and met with the schools' principals to familiarize them with the purpose of the current study and the data collection tool. Furthermore, the researcher requested the principals to conduct a faculty meeting during which they introduced the researcher to the teachers. Next, the researcher took the stage to acquaint the teachers with the purpose of the study and its key importance to their instructional performance.

Also, the researcher stressed the fact that they could refuse to take part in the study without any penalty, that the data are not to be accessed by an external party, and that their anonymity will not be compromised. If they were still willing to participate, then the researcher distributed the consent forms (Appendix C) and the surveys to the research participants. After thirty minutes, the researcher gathered the consent forms and the surveys from the participants and genuinely thanked them for participating in the study.

After Data Collection

After collecting data from the research informants, the researcher separated the surveys of each school through assigning a number to each one (e.g., school 1, school 2). Afterwards, the data were imported to Microsoft Excel to facilitate its statistical analysis and presentation in graphs. Last, the surveys were safely stored in a locked cabinet, which is accessible only to the researcher, at GSE.

Validity and Reliability

First, validity, according to Taherdoost (2016), explains how the collected data precisely covers the actual area under investigation. To ensure the validity of the newly-constructed survey, it was piloted at the beginning of the second academic semester of the year 2019-2020 to a group of 25 STEM teachers; these teachers, who were not part of the study samples, were asked to complete it, comment on the appropriateness and ease of vocabulary, highlight redundant statements, and pinpoint any ambiguous terms. As a result, this pilot study produced no recommendations for changes.

Second, reliability refers to "the degree, to which the results, obtained by a measurement and a procedure can be repeated" (Bolarinwa, 2015, p. 195). To guarantee the reliability of the survey, Cronbach's alpha, which measures the internal consistency or homogeneity of items on a tool, was employed using Statistical Package for Social Sciences (SPSS). Consequently, it yielded a reliability of 0.86, indicating high internal consistency of items.

Data Analysis

Using SPSS, the data were descriptively analyzed. Measures of central tendency which are expressed in the mean, the median, and the mode were provided for each

statement in the survey. Furthermore, standard deviation was generated to determine the normal distribution of scores (Creswell, 2012).

Ethical Considerations

The sub-sections below address the necessary measures, taken to protect the participants from any danger. These measures included the National Institute for Health (NIH) training and consents from the Institutional Review Board (IRB) and the Central Agency for Public Mobilization and Statistics (CAPMAS).

National Institute for Health Training

"Ethics should be a pivotal consideration, rather than an afterthought, and it should be at the forefront of a researcher's plan" (Creswell, 2012, p. 23). Before launching the current study, the researcher underwent training provided by the NIH, which addresses the protection of research participants. This training aimed at enlightening and preparing researchers on how to preserve the rights of human participants. At the end of the online training session, the researcher sat for a summative quiz and passed it (Appendix B).

Institutional Review Board

Prior to collecting data from the research informants, the researcher obtained permission from the IRB, located at the American University in Cairo (AUC). IRB's decision-making parties, before granting permission to the researcher, thoroughly scrutinized the data collection procedures and instruments to ensure participants' protection from any physical or psychological damage (Appendix D).

Central Agency for Public Mobilization and Statistics

The researcher obtained approval from the CAPMAS. This approval allowed the researcher to administer the pencil-paper surveys inside public STEM schools (Appendix E).

Protection of research participants

After obtaining approvals from the IRB and CAPMAS, the researcher, before collecting data, gained written permissions from the research informants, signaling their consent to participate in the study. In addition, the researcher guaranteed their total anonymity by asking them not to write their names on the surveys and by emphasizing the fact that the data are not to be shared by external parties, are to be safely stored in a

locked cabinet at the Graduate School of Education (GSE), and are to be shredded after three years.

Delimitations

Delimitations are deemed as "those characteristics that arise from limitations in the scope of the study and by the conscious exclusionary and inclusionary decisions made during the development of the study plan" (George & Mallery, 2009, p. 230). In this study, there are two delimitations, which are elucidated below.

STEM Schools

This quantitative study was limited to a survey of teachers in three STEM schools, one of which is placed in Giza, the second is located in Cairo, and the third is situated in Qalyubia. Hence, this current study did not encompass all public STEM schools in Egypt since visiting them requires remarkable resources, efforts, and time.

Research Informants

The current study described the views of sixty-seven STEM teachers in relation to the effectiveness of short visits on their instructional performance. However, this study did not describe the views of schools' principals or MoE supervisors even though they would have perspicacious inputs concerning short visits.

Chapter Four: Presentation of Results

This chapter encompasses three sub-sections: an overview of the present study, presentation of results, and data comparison.

Overview of the Present Study

In Egyptian public STEM schools, the short visits' model is employed to enhance the quality of teaching and learning inside classrooms and ensure teachers' alignment with the schools' mission. This model encompasses three key elements: focus, classroom observations, and feedback. First, supervisors from Central STEM Unit select a focus for classroom observations; focus areas may involve classroom management, syllabus, or instructional pedagogies. Second, once the focus is established, supervisors collect data using a tool during classroom observations. Last, they meet with the teachers to provide them with accurate, evidence-based feedback (A. Kamoun, personal communication, October 7, 2019).

Although the short visits' model aims at improving the quality of teaching and learning inside STEM schools, MoE supervisors reported that teachers "perform at very low standards inside the classrooms" (World Bank, 2016, p. 22) and are dependent on outdated instructional pedagogies, which emphasize rote learning and memorization of facts. Hence, this study aimed at describing STEM teachers' views about the effectiveness of short visits on their instructional performances; it was guided by the main research question and sub-questions below:

RQ: How do teachers view the effectiveness of short visits on their instructional performance?

Sub-Q1: To what extent do short visits impact STEM teachers' instructional practices?

Sub-Q2: To what extent do STEM teachers perceive that the short visits' model is an effective process for measuring the use of research-based instructional strategies?

The theoretical model, used in this study, is Kubicek's Classroom Walkthrough Observation Process (2015). It involves three main sections: (a) gather, clarify, and reflect on evidence, (b) provide resources and support, and (c) promote deliberate practice. First, section (a) is centered on collecting evidence about teachers' instructional strategies and providing them with feedback. Second, section (b) aims at providing

additional resources to teachers and offering professional development opportunities. Last, section (c) encourages teachers to continue utilizing effective instructional practices inside classrooms.

A survey research design was selected as the most suitable method; accordingly, a 5-point Likert survey, ranging from Strongly Agree (SA) to Strongly Disagree (SD), was constructed by the researcher to collect data from the research participants. It encompasses two main sections: demographic data and Kubicek's Classroom Walkthrough Observation Process Model (2015). In the 1st section, demographic questions, such as gender, years of experience, age, subject taught, and highest degree earned, are posed. In the 2nd section, twenty statements, adapted from Kubicek's Model, tackle the frequency and aim of class observations, supervisors' duties during and after class observations, their roles during post-observation conferences, and their roles during follow-ups.

Presentation of Results: Otis School

Demographic Data

First, out of the 25 research participants, 76% are males and 24% are females. Second, 20% were between 31 and 40 years old, 52% were between 41 and 50 years old, and 28% were over 50 years old. Third, 32% had between 11 and 20 years of experience, 60% had between 21 and 30 years of experience, and 8% had between 31 and 40 years of experience. Fourth, 44% held a bachelor's degree, 44% held a diploma, 4% held a master's degree, and 8% held a doctorate degree. Fifth, 12% taught English, 16% taught biology, 12% taught chemistry, 8% taught geology, 20% taught physics, 24% taught mathematics, 4% taught French, and 4% taught German. Table 2 summarizes teachers' demographic data at Otis school.

Table 2

Teachers' Demographic Data

Demographics	Category	Percentage
Gender	Male	76%
	Female	24%
Age	31-40 Years Old	20%
	41-50 Years Old	52%
	Over 50 Years Old	28%

Years of Experience	11-20 Years	32%
	21-30 Years	60%
	31-40 Years	8%
Highest Degree Earned	Bachelor Degree	44%
	Diploma	44%
	Master's Degree	4%
	Doctorate Degree	8%
Subject Taught	English	12%
	biology	16%
	chemistry	12%
	geology	8%
	physics	20%
	mathematics	24%
	French	4%
	German	4%

Survey Data

Frequency and Aim of Classroom Observations. None of the teachers strongly agreed that their supervisors conduct regular class visits, 20% agreed, 24% were neutral, 24% disagreed, and 32% strongly disagreed. 32% strongly agreed that classroom visits are conducted with the aim of catching them off-guard, 40% agreed, 4% were neutral, 12% disagreed, and 12% strongly disagreed. 20% strongly agreed that unannounced classroom visits put them under pressure, 20% agreed, 12% were neutral, 32% disagreed, and 16% strongly disagreed. 8% strongly agreed that classroom visits strengthen their professional development and growth, 48% agreed, 12% were neutral, 20% disagreed, and 12% strongly disagreed. Table 3 presents the measures of central tendency and standard deviation for statements 1 to 4. Figure 1 shows teachers' responses in graphic form. Note that although teachers agree that class visits are valuable for their growth, they report their belief that the aim of these visits is to catch them off-guard.

Table 3

Descriptive Statistics for Statements 1 to 4

		Regular visits	Visits' aim	Visits' effect	Professional development
N	Valid	25	25	25	25
	Missing	0	0	0	0
Mean		2.32	3.76	2.96	3.02
Median		2.00	4.00	3.00	4.00
Mode		1	4	2	4
Std. Deviation		1.144	1.267	1.428	1.224

Table 4 shows the short descriptors matched with the full statement from the survey.

Table 4
Descriptors' Table

Statements	Descriptors
My supervisor conducts regular classroom visits.	Regular visits
Classroom visits are conducted to catch teachers off-guard.	Visits' aim
Unannounced classroom visits put me under pressure.	Visits' effect
Classroom visits strengthen my professional development and growth.	Professional development

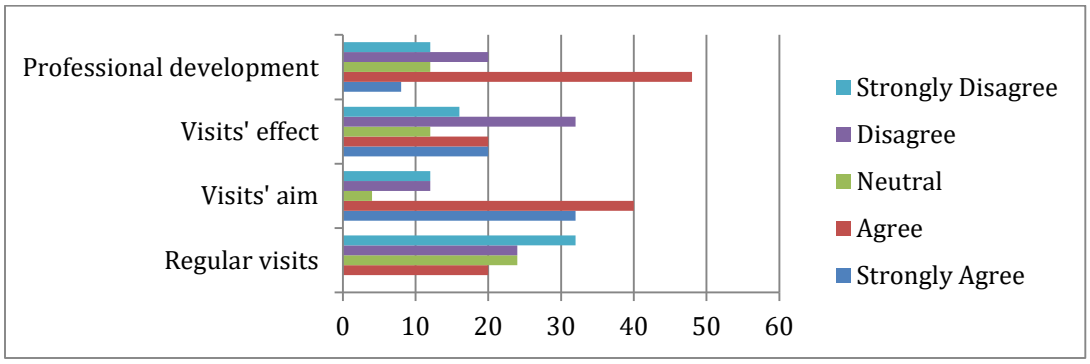

***Fig. 1*: Teachers' responses in relation to statements 1 to 4**

Supervisors' Roles during and after Classroom Observations. 16% of the teachers strongly agreed that their supervisors establish a trusting relationship with them, 48% agreed, none of them were neutral, 8% disagreed, and 28% strongly disagreed. 12% strongly agreed that their supervisors collect evidence of their instructional practices during classroom visits, 40% agreed, 24% were neutral, 12% disagreed, and 12% strongly disagreed. 16% strongly agreed that their supervisors provide them with timely feedback after classroom visits, 32% agreed, 20% were neutral, 16% disagreed, and 16% strongly disagreed. 8% strongly agreed that their supervisors provide them with feedback about their instructional performance, 48% agreed, 12% were neutral, 8% disagreed, and 24% strongly disagreed. 20% strongly agreed that they are allowed to reflect on the feedback with their supervisors, 32% agreed, 16% were neutral, 8% disagreed, and 24% strongly disagreed. 20% strongly agreed that they change their teaching style according

to their supervisors' feedback, 32% agreed, 20% were neutral, 16% disagreed, and 12% strongly disagreed. 16% strongly agreed that their supervisors' feedback is constructive and satisfactory, 32% agreed, 20% were neutral, 16% disagreed, and 16% strongly disagreed. Table 5 demonstrates the measures of central tendency and standard deviation for statements 5 to 11. Figure 2 presents teachers' responses regarding statements 5 to 11; note that teachers agree that they change their teaching styles after being provided with constructive feedback.

Table 5

Descriptive Statistics for Statements 5 to 11

		Trust	Data	Timely feedback	Performance feedback	Reflection	Instruction	Accurate feedback
N	Valid	25	25	25	25	25	25	25
	Missing	0	0	0	0	0	0	0
Mean		3.16	3.28	3.16	3.08	3.16	3.32	3.16
Median		4.00	4.00	3.00	4.00	4.00	4.00	3.00
Mode		4	4	4	4	4	4	4
Std. Deviation		1.545	1.208	1.344	1.382	1.491	1.314	1.344

Table 6

Descriptors' Table

Statements	Descriptors
My supervisor establishes a trusting relationship with me.	Trust
My supervisor collects evidence of my instructional practices during class visits.	Data
My supervisor provides me with timely feedback after class visits.	Timely feedback
My supervisor provides me with feedback about my instructional performance.	Performance feedback
I am allowed to reflect on the feedback with my supervisor.	Reflection
I change my teaching style according to my supervisor's feedback	Instruction
My supervisor's feedback is constructive and satisfactory.	Accurate feedback

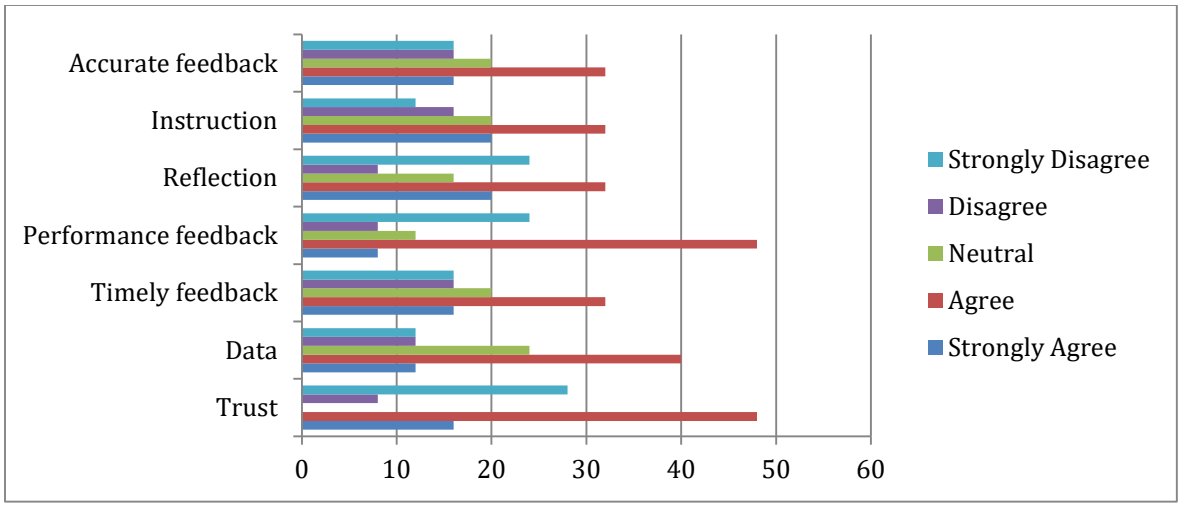

***Fig. 2*: Teachers' responses regarding statements 5 to 11**

Supervisors' Duties during Post-Observation Conferences. 8% of the teachers strongly agreed that their supervisors create an improvement plan to adjust their instructional performances, 20% agreed, 12% were neutral, 28% disagreed, and 32% strongly disagreed. 4% strongly agreed that their supervisors conduct follow-up visits after implementing new instructional strategies, 12% agreed, 24% were neutral, 28% disagreed, and 32% strongly disagreed. 4% strongly agreed that their supervisors provide them with resources to enhance their instructional performances, 20% agreed, 16% were neutral, 32% disagreed, and 28% strongly disagreed. 8% strongly agreed that the resources help them improve their shortcomings, 12% agreed, 24% were neutral, 36% disagreed, and 20% strongly disagreed. 12% strongly agreed that the resources contribute to their professional growth and development, 20% agreed, 16% were neutral, 28% disagreed, and 24% strongly disagreed. Table 7 exhibits the measures of central tendency and standard deviation for statements 12 to 16. Figure 3 features teachers' responses concerning statements 12 to 16; note that although teachers agree that they are provided with resources, they indicate that these resources do not improve their shortcomings.

Table 7

Descriptive Statistics for Statements 12 to 16

		Improvement plan	Follow-up	Resources	Improving shortcomings	Professional growth
N	Valid	25	25	25	25	25
	Missing	0	0	0	0	0
Mean		2.44	2.28	2.04	2.52	2.68
Median		2.00	2.00	2.00	2.00	2.00
Mode		1	1	2	2	2
Std. Deviation		1.356	1.173	1.224	1.194	1.375

Table 8

Descriptors' Table

Statements	Descriptors
My supervisor creates an improvement plan to adjust my performance.	Improvement plan
My supervisor conducts follow-ups after implementing new strategies.	Follow-up
My supervisor provides me with resources to enhance my performance.	Resources
The resources help me to improve my shortcomings.	Improving shortcomings
The resources contribute to my professional growth and development.	Professional growth

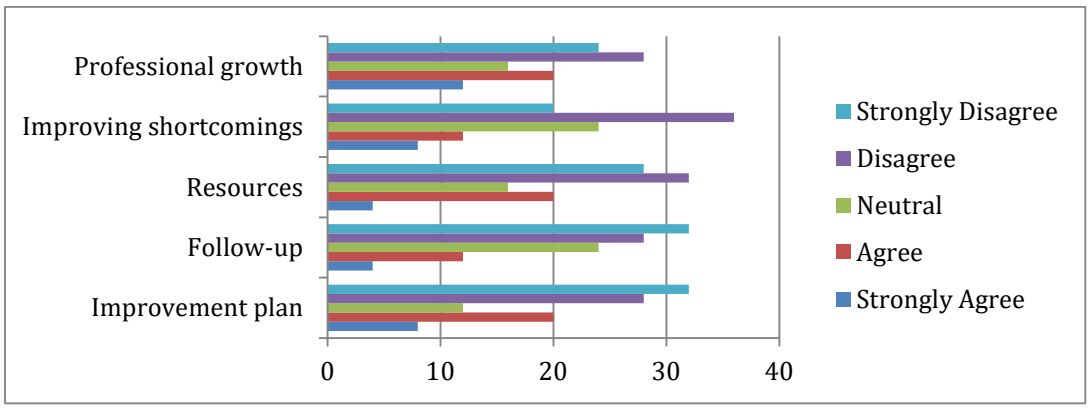

***Fig. 3*: Teachers' responses concerning statements 12 to 16**

Supervisors' Tasks during Follow-ups. 16% of the teachers strongly agreed that their supervisors motivate them to use effective instructional practices, 32% agreed, 16% were neutral, 16% disagreed, and 20% strongly disagreed. 36% strongly agreed that they

are encouraged to employ new teaching techniques, 32% agreed, 16% were neutral, 8% disagreed, and 8% strongly disagreed. 4% strongly agreed that their supervisors urge them to use teaching practices that emphasize memorization, 24% agreed, 20% were neutral, 32% disagreed, and 20% strongly disagreed. 16% strongly agreed that class visits hold them accountable to employ effective instructional practices, 40% agreed, 12% were neutral, 20% disagreed, and 12% strongly disagreed. Table 9 presents the measures of central tendency and standard deviation for statements 17 to 20. Figure 4 displays teachers' responses regarding statements 17 to 20; note that teachers agree that class visits hold them accountable to use effective instructional practices.

Table 9

Descriptive Statistics for Statements 17 to 20

		Effective practices	Novel techniques	Outdated practices	Accountability
N	Valid	25	25	25	25
	Missing	0	0	0	0
Mean		3.08	3.08	2.06	3.28
Median		3.00	4.00	2.00	4.00
Mode		4	5	2	4
Std. Deviation		1.411	1.258	1.190	1.307

Table 10

Descriptors' Table

Statements	Descriptors
My supervisor motivates me to integrate effective instructional practices.	Effective practices
I am encouraged to employ new teaching techniques inside classrooms.	Novel techniques
My supervisor urges me to incorporate practices which emphasize memorization.	Outdated practices
Classroom visits hold me accountable to employ effective instructional practices.	Accountability

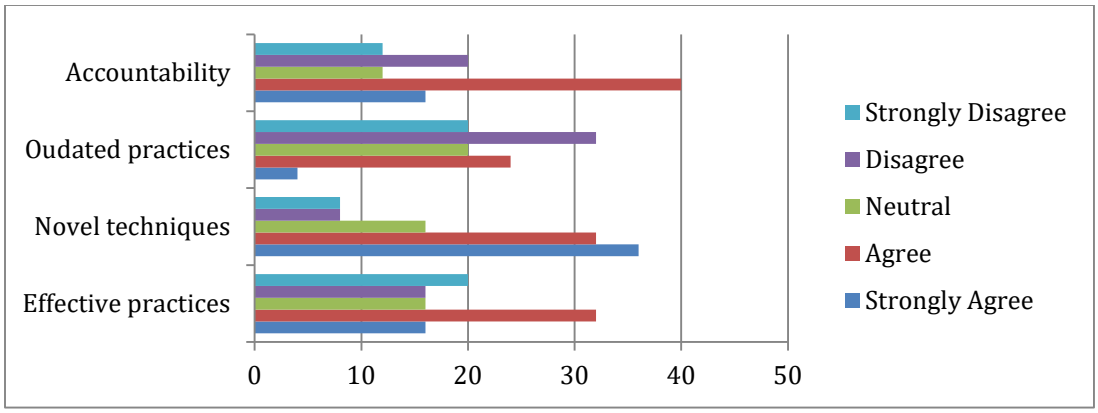

***Fig. 4*: Teachers' responses with respect to statements 17 to 20**

Presentation of Results: Ottavia School

Demographic Data

First, out of the 22 research participants, 60% are males and 40% are females. Second, 13% were between 31 and 40 years old, 60% were between 41 and 50 years old, and 27% were over 50 years old. Third, 22.7% had between 11 and 20 years of experience, 54.5% had between 21 and 30 years of experience, and 22.8% had between 31 and 40 years of experience. Fourth, 63.6% held a bachelor's degree, 18.4% held a diploma, 9% held a master's degree, and 9% held a doctorate degree. Fifth, 22.7% taught English, 9% taught Arabic, 13.6% taught biology, 13.6% taught chemistry, 9% taught geology, 13.6% taught physics, 9% taught mathematics, 5% taught social studies, and 4.5% taught German. Table 11 summarizes teachers' demographic data at Ottavia school.

Table 11

Teachers' Demographic Data

Demographics	Category	Percentage
Gender	Male	60%
	Female	40%
Age	31-40 Years Old	13%
	41-50 Years Old	60%
	Over 50 Years Old	27%
Years of Experience	11-20 Years	22.7%
	21-30 Years	54.5%
	31-40 Years	22.8%
Highest Degree Earned	Bachelor Degree	63.6%
	Diploma	18.4%
	Master's Degree	9%
	Doctorate Degree	9%

Subject Taught	English	22.7%
	Arabic	9%
	biology	13.6%
	chemistry	13.6%
	geology	9%
	physics	13.6%
	mathematics	9%
	social studies	5%
	German	4.5%

Survey Data

Frequency and Aim of Classroom Observations. 32% of the teachers strongly agreed that their supervisors conduct regular class visits, 36.3% agreed, 22.7% were neutral, 4.5% disagreed, and 4.5% strongly disagreed. None of the teachers strongly agreed that classroom visits are conducted with the aim of catching them off-guard, 31.8% agreed, 22.7% were neutral, 9% disagreed, and 36.5% strongly disagreed. 13.6% strongly agreed that unannounced classroom visits put them under pressure, 22.9% agreed, 40.9% were neutral, 4.5% disagreed, and 18.1% strongly disagreed. 13.8% strongly agreed that classroom visits strengthen their professional development and growth, 40.9% agreed, 22.7% were neutral, 18.1% disagreed, and 4.5% strongly disagreed. Table 12 presents the measures of central tendency and standard deviation for statements 1 to 4. Figure 5 shows teachers' responses in relation to statements 1 to 4; note that although teachers agree that class visits put them under pressure, they also report that class visits strengthen their professional development and growth.

Table 12

Descriptive Statistics for Statements 1 to 4

		Regular visits	Visits' aim	Visits' effect	Professional development
N	Valid	22	22	22	22
	Missing	0	0	0	0
Mean		3.86	2.50	3.09	3.41
Median		4.00	3.00	3.00	4.00
Mode		4	1	3	4
Std. Deviation		1.082	1.300	1.269	1.098

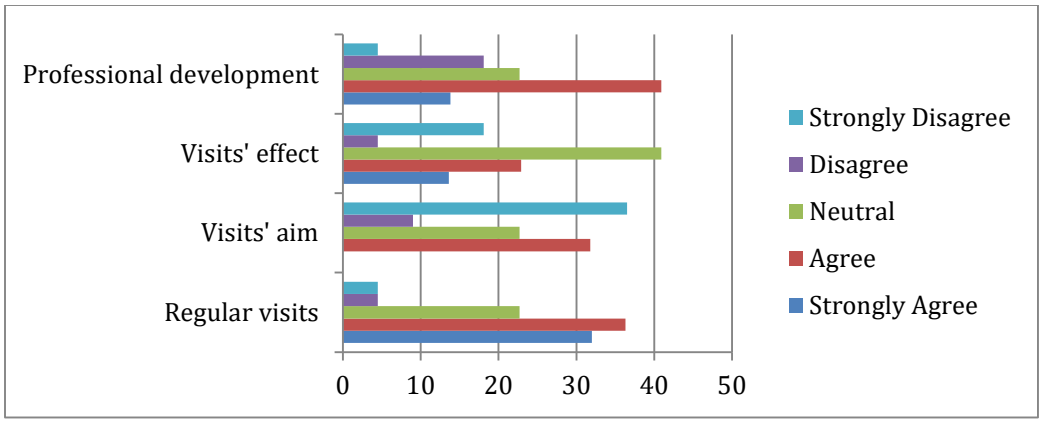

***Fig. 5*: Teachers' responses in relation to statements 1 to 4**

Supervisors' Roles during and after Classroom Observations. 45.6% of the teachers strongly agreed that their supervisors establish a trusting relationship with them, 27.2% agreed, 22.7% were neutral, none of them disagreed, and 4.5% strongly disagreed. 40.9% strongly agreed that their supervisors collect evidence of their instructional practices during classroom visits, 36.5% agreed, 18.1% were neutral, 4.5% disagreed, and none of them strongly disagreed. 22.7% strongly agreed that their supervisors provide them with timely feedback after classroom visits, 36.3% agreed, 13.6% were neutral, 13.8% disagreed, and 13.6% strongly disagreed. 18.4% strongly agreed that their supervisors provide them with feedback about their instructional performance, 27.2% agreed, 22.7% were neutral, 18.1% disagreed, and 13.6% strongly disagreed. 31.8% strongly agreed that they are allowed to reflect on the feedback with their supervisors, 40.9% agreed, 13.6% were neutral, 4.5% disagreed, and 9.2% strongly disagreed. 18.1% strongly agreed that they change their teaching style according to their supervisors' feedback, 36.7% agreed, 27.2% were neutral, 9% disagreed, and 9% strongly disagreed. 18.1% strongly agreed that their supervisors' feedback is constructive and satisfactory, 31.8% agreed, 27.2% were neutral, 13.6% disagreed, and 9.3% strongly disagreed. Table 13 demonstrates the measures of central tendency and standard deviation for statements 5 to 11. Figure 6 presents teachers' responses regarding statements 5 to 11; note that teachers change their teaching styles after being provided with constructive feedback.

Table 13

Descriptive Statistics for Statements 5 to 11

		Trust	Data	Timely feedback	Performance feedback	Reflection	Instruction	Accurate feedback
N	Valid	22	22	22	22	22	22	22
	Missing	0	0	0	0	0	0	0
Mean		4.09	4.14	3.41	3.18	3.82	3.45	3.36
Median		4.00	4.00	4.00	3.00	4.00	4.00	3.50
Mode		5	5	4	4	4	4	4
Std. Deviation		1.065	.889	1.368	1.332	1.220	1.184	1.217

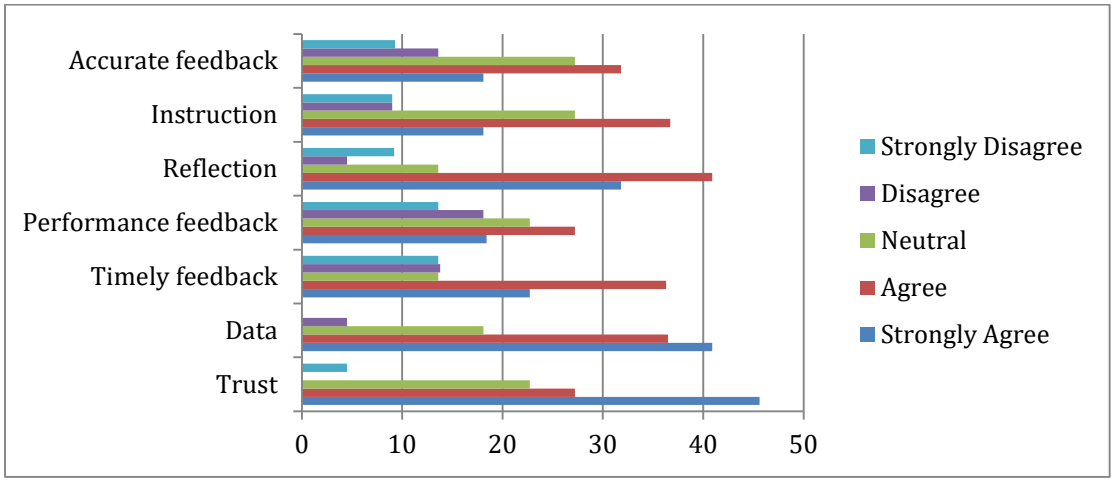

***Fig. 6*: Teachers' responses regarding statements 5 to 11**

Supervisors' Duties during Post-Observation Conferences. 4.5% of the teachers strongly agreed that their supervisors create an improvement plan to adjust their instructional performances, 45.5% agreed, 2% were neutral, 4.5% disagreed, and 43.5% strongly disagreed. 18.1% strongly agreed that their supervisors conduct follow-up visits after implementing new instructional strategies, 31.8% agreed, 4.5% were neutral, 18.1% disagreed, and 27.5% strongly disagreed. 40.9% strongly agreed that their supervisors provide them with resources to enhance their instructional performances, 22.7% agreed, 4.5% were neutral, 22.7% disagreed, and 9.2% strongly disagreed. 40.9% strongly agreed that the resources help them improve their shortcomings, 18.1% agreed, 13.6% were neutral, 22.9% disagreed, and 4.5% strongly disagreed. 54.5% strongly agreed that the resources contribute to their professional growth and development, 9% agreed, 13.6% were neutral, 18.4% disagreed, and 4.5% strongly disagreed. Table 14 exhibits the measures of central tendency and standard deviation for statements 12 to 16. Figure 7

shows teachers' responses concerning statements 12 to 16; note that although teachers agree that they are provided with resources, they emphasize that these resources do not contribute to their professional growth and development.

Table 14

Descriptive Statistics for Statements 12 to 16

		Improvement plan	Follow-up	Resources	Improving shortcomings	Professional growth
N	Valid	22	22	22	22	22
	Missing	0	0	0	0	0
Mean		2.77	2.95	3.63	3.68	3.90
Median		3.50	3.50	4.00	4.00	5.00
Mode		4	4	5	5	5
Std. Deviation		1.477	1.557	1.465	1.358	1.376

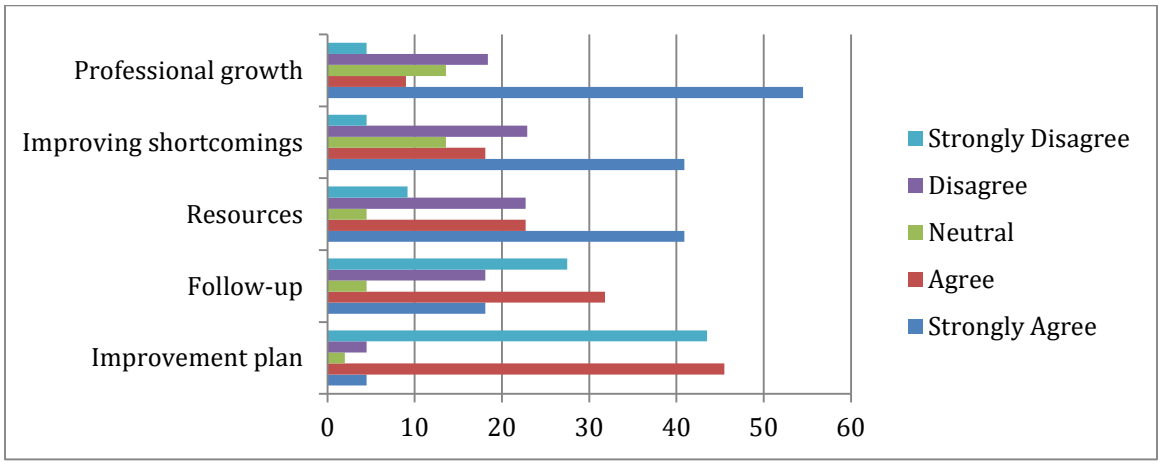

***Fig. 7*: Teachers' responses concerning statements 12 to 16**

Supervisors' Tasks during Follow-ups. 18.1% of the teachers strongly agreed that their supervisors motivate them to use effective instructional practices, 40.9% agreed, 18.1% were neutral, 13.6% disagreed, and 9.3% strongly disagreed. 22.7% strongly agreed that they are encouraged to employ new teaching techniques inside the classrooms, 59% agreed, 9% were neutral, 9.3% disagreed, and none of them strongly disagreed. 4.5% strongly agreed that their supervisors urge them to incorporate teaching practices which emphasize memorization, 13.6% agreed, 18.1% were neutral, 50% disagreed, and 13.8% strongly disagreed. 22.7% strongly agreed that classroom visits hold them accountable to employ effective instructional practices, 31.8% agreed, 4.5% were neutral, 36.5% disagreed, and 4.5% strongly disagreed. Table 15 illustrates the

measures of central tendency and standard deviation for statements 17 to 20. Figure 8 displays teachers' responses with respect to statements 17 to 20; note that although teachers agree that they are encouraged to employ new teaching techniques, they also report that class visits do not hold them accountable to use effective practices.

Table 15

Descriptive Statistics for Statements 17 to 20

		Effective practices	Novel techniques	Outdated practices	Accountability
N	Valid	22	22	22	22
	Missing	0	0	0	0
Mean		3.45	3.95	2.45	3.31
Median		4.00	4.00	2.00	4.00
Mode		4	4	2	2
Std. Deviation		1.224	.844	1.057	1.323

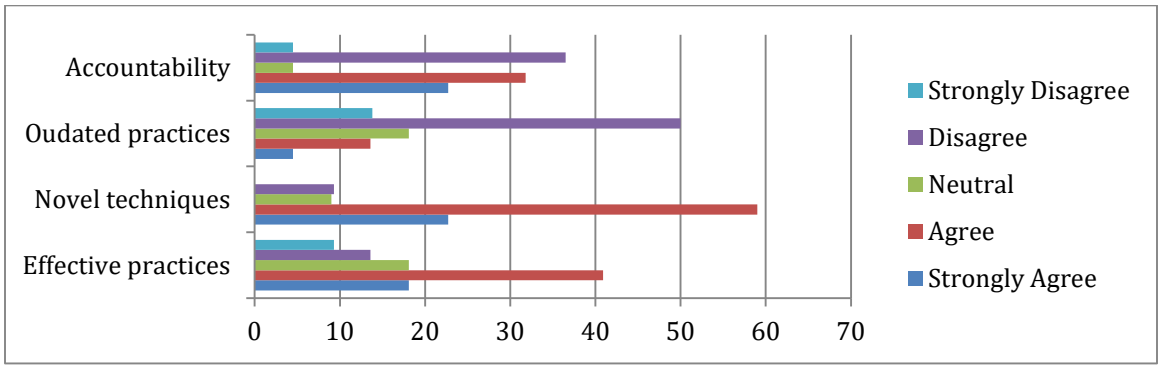

***Fig. 8*: Teachers' responses with respect to statements 17 to 20**

Presentation of Results: Oakley School

Demographic Data

First, out of the 20 research participants, 70% are males and 30% are females. Second, 50% were between 31 and 40 years old, 30% were between 41 and 50 years old, and 20% were over 50 years old. Third, 50% had between 11 and 20 years of experience, 50% had between 21 and 30 years of experience, and 0% had between 31 and 40 years of experience. Fourth, 45% held a bachelor's degree, 30% held a diploma, 0% held a master's degree, and 25% held a doctorate degree. Fifth, 20% taught English, 15% taught Arabic, 10% taught biology, 10% taught chemistry, 5% taught geology, 10% taught physics, 20% taught mathematics, 5% taught French, and 5% taught German. Table 16 encapsulates teachers' demographic data at Oakley school.

Table 16

Teachers' Demographic Data

Demographics	Category	Percentage
Gender	Male	70%
	Female	30%
Age	31-40 Years Old	50%
	41-50 Years Old	30%
	Over 50 Years Old	20%
Years of Experience	11-20 Years	50%
	21-30 Years	50%
	31-40 Years	0%
Highest Degree Earned	Bachelor Degree	45%
	Diploma	30%
	Master's Degree	0%
	Doctorate Degree	25%
Subject Taught	English	20%
	Arabic	15%
	biology	10%
	chemistry	10%
	geology	5%
	physics	10%
	mathematics	20%
	French	5%
	German	5%

Survey Data

Frequency and Aim of Classroom Observations. 20% of the teachers strongly agreed that their supervisors conduct regular class visits, 20% agreed, 30% were neutral, 10% disagreed, and 20% strongly disagreed. 10% strongly agreed that classroom visits are conducted with the aim of catching them off-guard, 20% agreed, 25% were neutral, 10% disagreed, and 35% strongly disagreed. 20% strongly agreed that unannounced classroom visits put them under pressure, 45% agreed, 10% were neutral, 20% disagreed, and 5% strongly disagreed. 20% strongly agreed that classroom visits strengthen their professional development and growth, 35% agreed, 20% were neutral, 20% disagreed, and 5% strongly disagreed. Table 17 illustrates the measures of central tendency and standard deviation for statements 1 to 4. Figure 9 exhibits teachers' responses in relation to statements 1 to 4; note that although teachers agree that class visits put them under pressure, they also report that class visits strengthen their development and growth.

Table 17

Descriptive Statistics for Statements 1 to 4

		Regular visits	Visits' aim	Visits' effect	Professional development
N	Valid	20	20	20	20
	Missing	0	0	0	0
Mean		3.01	2.06	3.55	3.45
Median		3.00	3.00	4.00	4.00
Mode		3	1	4	4
Std. Deviation		1.410	1.429	1.190	1.190

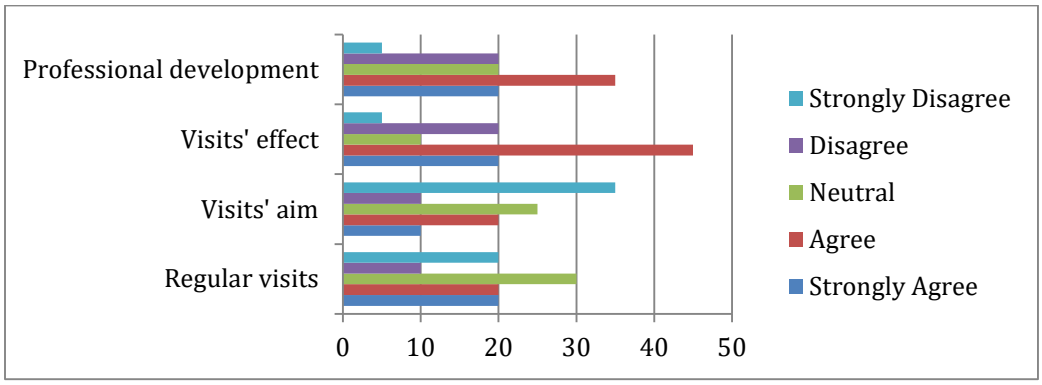

***Fig. 9*: Teachers' responses in relation to statements 1 to 4**

Supervisors' Roles during and after Classroom Observations. 15% of the teachers strongly agreed that their supervisors establish a trusting relationship with them, 35% agreed, 25% were neutral, 20% disagreed, and 5% strongly disagreed. 35% strongly agreed that their supervisors collect evidence of their instructional practices during classroom visits, 35% agreed, 20% were neutral, none of them disagreed, and 10% strongly disagreed. 40% strongly agreed that their supervisors provide them with timely feedback after classroom visits, 25% agreed, 5% were neutral, 5% disagreed, and 25% strongly disagreed. 25% strongly agreed that their supervisors provide them with feedback about their instructional performance, 40% agreed, 5% were neutral, 5% disagreed, and 25% strongly disagreed. 25% strongly agreed that they are allowed to reflect on the feedback with their supervisors, 35% agreed, 15% were neutral, 15% disagreed, and 10% strongly disagreed. 40% strongly agreed that they change their teaching style according to their supervisors' feedback, 30% agreed, 10% were neutral, 5% disagreed, and 15% strongly disagreed. 25% strongly agreed that their supervisors' feedback is constructive and satisfactory, 30% agreed, 25% were neutral, 10% disagreed,

and 10% strongly disagreed. Table 18 exhibits the measures of central tendency and standard deviation for statements 5 to 11. Figure 10 demonstrates teachers' responses regarding statements 5 to 11; note that teachers change their teaching styles after being provided with constructive feedback.

Table 18

Descriptive Statistics for Statements 5 to 11

		Trust	Data	Timely feedback	Performance feedback	Reflection	Instruction	Accurate feedback
N	Valid	20	20	20	20	20	20	20
	Missing	0	0	0	0	0	0	0
Mean		3.35	3.85	3.05	3.35	3.05	3.75	3.05
Median		3.05	4.00	4.00	4.00	4.00	4.00	4.00
Mode		4	4	5	4	4	5	4
Std. Deviation		1.136	1.225	1.670	1.565	1.317	1.446	1.277

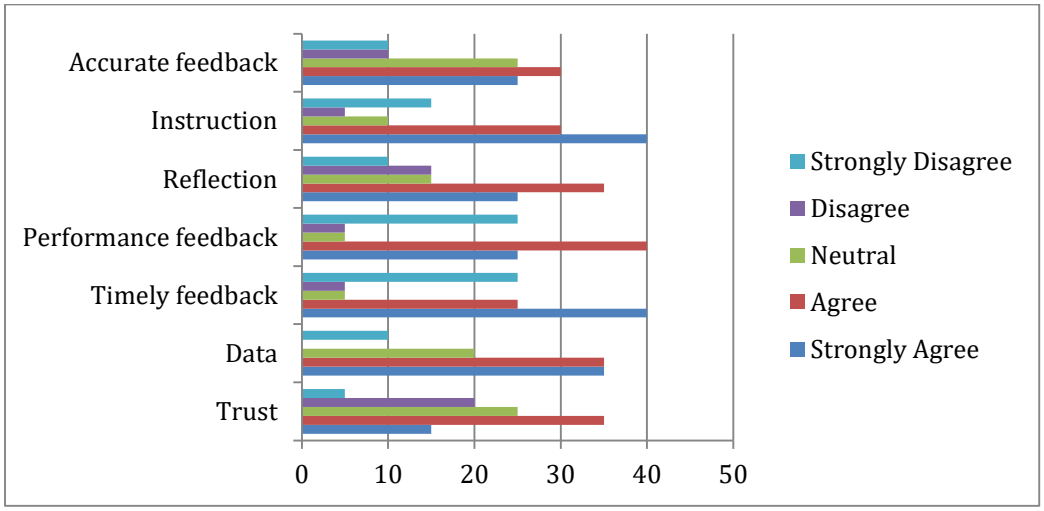

***Fig. 10*: Teachers' responses regarding statements 5 to 11**

Supervisors' Duties during Post-Observation Conferences. 25% of the teachers strongly agreed that their supervisors create an improvement plan to adjust their instructional performances, 15% agreed, 15% were neutral, 15% disagreed, and 30% strongly disagreed. 15% strongly agreed that their supervisors conduct follow-up visits after implementing new instructional strategies, 20% agreed, 10% were neutral, 30% disagreed, and 25% strongly disagreed. 15% strongly agreed that their supervisors provide them with resources to enhance their instructional performances, 20% agreed, 10% were neutral, 20% disagreed, and 35% strongly disagreed. 25% strongly agreed that

the resources help them improve their shortcomings, 25% agreed, 10% were neutral, 10% disagreed, and 30% strongly disagreed. 25% strongly agreed that the resources contribute to their professional growth and development, 25% agreed, none of them were neutral, 20% disagreed, and 30% strongly disagreed. Table 19 presents the measures of central tendency and standard deviation for statements 12 to 16. Figure 11 highlights teachers' responses concerning statements 12 to 16; note that teachers agree that they are provided with resources that improve their weaknesses and contribute to their growth and development.

Table 19

Descriptive Statistics for Statements 12 to 16

		Improvement plan	Follow-up	Resources	Improving shortcomings	Professional growth
N	Valid	20	20	20	20	20
	Missing	0	0	0	0	0
Mean		2.09	2.07	2.06	3.05	2.95
Median		3.00	2.00	2.00	3.05	3.00
Mode		1	2	1	1	1
Std. Deviation		1.618	1.454	1.535	1.637	1.669

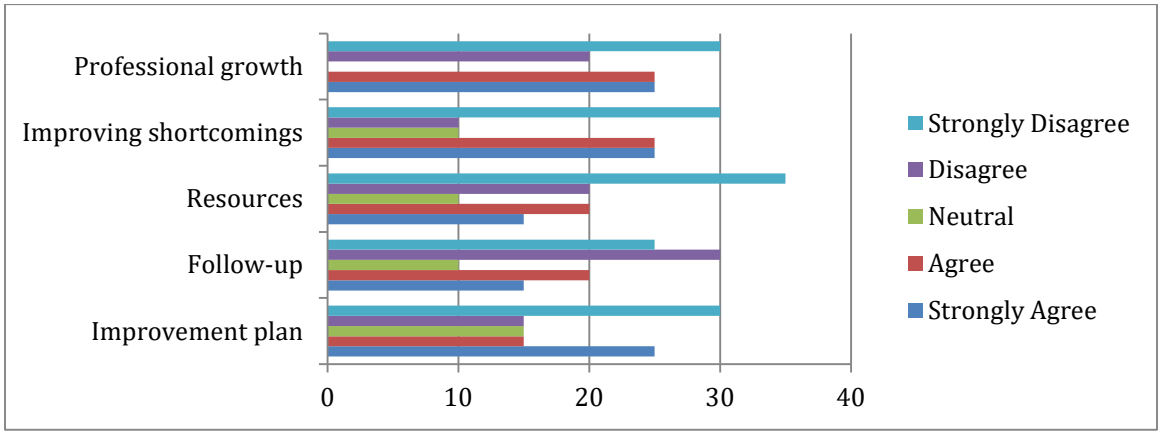

***Fig. 11*: Teachers' responses concerning statements 12 to 16**

Supervisors' Tasks during Follow-ups. 30% of the teachers strongly agreed that their supervisors motivate them to use effective instructional practices, 25% agreed, 10% were neutral, 30% disagreed, and 5% strongly disagreed. 30% strongly agreed that they are encouraged to employ new teaching techniques, 40% agreed, 5% were neutral, 20% disagreed, and 5% strongly disagreed. 5% strongly agreed that their supervisors urge them to use teaching practices which emphasize memorization, 25% agreed, 15% were

neutral, 15% disagreed, and 40% strongly disagreed. 20% strongly agreed that class visits hold them accountable to employ effective instructional practices, 30% agreed, 15% were neutral, 20% disagreed, and 15% strongly disagreed. Table 20 demonstrates the measures of central tendency and standard deviation for statements 17 to 20. Figure 12 shows teachers' responses regarding statements 17 to 20; note that teachers agree that class visits hold them accountable to use effective practices.

Table 20

Descriptive Statistics for Statements 17 to 20

		Effective practices	Novel techniques	Outdated practices	Accountability
N	Valid	20	20	20	20
	Missing	0	0	0	0
Mean		3.45	3.07	2.04	3.02
Median		4.00	4.00	2.00	3.05
Mode		5	4	1	4
Std. Deviation		1.356	1.260	1.391	1.399

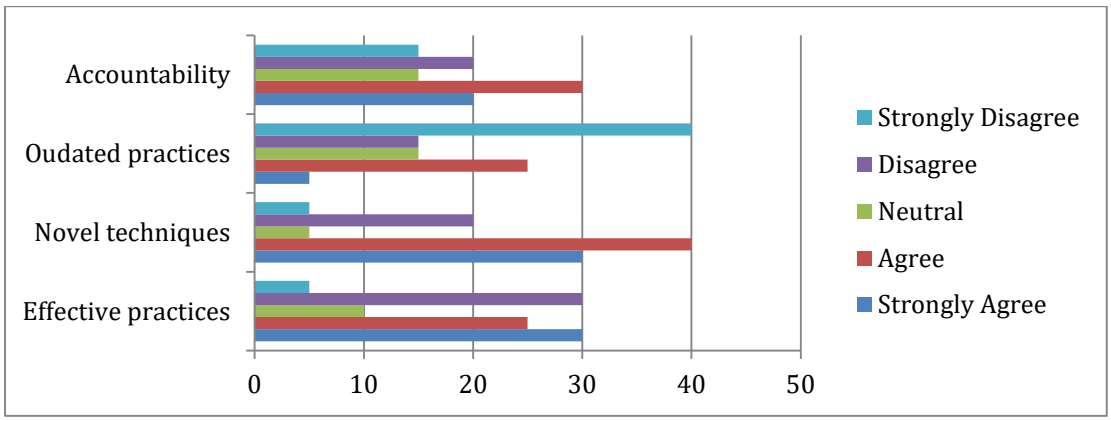

***Fig. 12*: Teachers' responses with respect to statements 17 to 20**

Data Comparison

Teachers' survey responses, across the three schools, are compared in terms of mean, median, and mode.

Frequency and Aim of Classroom Observations

In relation to supervisors' regular visits, the statistical mean, across the three schools, differs. In Otis, the mean is 2.32, indicating that the average response to this statement is disagree. Yet, the mean, in Ottavia, is 3.86, showing that the average response is drawn towards agree. In Oakley, the mean is 3.1, representing the fact that the

average response is neutral. As well, the median, across the three schools, contrasts. In Otis, the middle number in the data set is 2, showing the fact that the number of teachers who selected disagree or strongly disagree is greater than those who selected neutral, agree, or strongly agree. In Ottavia, the middle number in the data set is 4, implying that the number of teachers who selected strongly disagree, disagree, or neutral is less than those who selected agree or strongly agree. In Oakley, the middle number in the data set is 3, denoting that the number of teachers who selected strongly disagree, disagree, or neutral is nearly equal to those who selected agree or strongly agree. Last, the mode, across the three schools, diverges. In Otis, the most frequent response to supervisors' regular visits is strongly disagree. In contrast to Otis, the most frequent response in Ottavia is agree. Yet, the most frequent response in Oakley is neutral (see Table 21).

As for the visits' aim, the statistical mean of Otis is different, in comparison to Ottavia and Oakley. In Otis, the mean is 3.76, stressing the fact that the average response to this statement is more drawn towards agree. Compared to Otis, the means for Ottavia and Oakley are 2.50 and 2.06 respectively, revealing that the average response is disagree. Therefore, the median of Otis contrasts with that of Ottavia and Oakley. In Otis, the middle number in the data set is 4, highlighting that the number of teachers who selected strongly disagree, disagree, or neutral is less than those who selected agree or strongly agree. However, the middle number in the data set of Ottavia and Oakley is 3, underscoring that the number of teachers who selected strongly disagree or disagree is less than those who selected neutral, agree, or strongly agree. Last, the mode of Otis differs from that of Ottavia and Oakley. In Otis, the most frequent response to the visits' aim is agree, whereas the most frequent response in Ottavia and Oakley is strongly disagree (see Table 21).

In regards to the visits' effect, the statistical mean of Otis slightly diverges from that of Ottavia and Oakley. In Otis, the mean is 2.96, showing the fact that the average response to this statement is more inclined to neutral. However, the means of Ottavia and Oakley are 3.09 and 3.55 respectively, demonstrating that the average response is neutral. In comparison to Oakley, the median of Otis and Ottavia is similar. In Otis and Ottavia, the middle number in the data set is 3, exhibiting that the number of teachers who selected strongly disagree or disagree is equal to those who selected neutral, agree, or

strongly agree. Yet, the middle number in the data set of Oakley is 4, revealing that the number of teachers who selected disagree or strongly disagree is less than those who selected neutral, agree, or strongly agree. Last, the mode, across the three schools, contrasts. In Otis, the most frequent response is disagree, while the most frequent response in Ottavia is neutral. Yet, the most frequent response in Oakley is agree (see Table 21).

Concerning professional development, the statistical mean of Otis contrasts with that of Ottavia and Oakley. In Otis, the mean is 3.02, demonstrating that the average response for this statement is neutral. Yet, the means of Ottavia and Oakley are 3.41 and 3.45 respectively, denoting that the average response is inclined towards agree. Besides, the median of the three schools is similar; the middle number in the data set is 4, signifying that the number of teachers who selected strongly disagree or disagree is less than those who selected neutral, agree, or strongly agree. Last, the mode of the three schools is similar; the most frequent response is agree (see Table 21).

Table 21

Descriptive Statistics for Statements 1 to 4

		Regular visits	Visits' aim	Visits' effect	Professional development
Otis	Mean	2.32	3.76	2.96	3.02
	Median	2.00	4.00	3.00	4.00
	Mode	1	4	2	4
Ottavia	Mean	3.86	2.50	3.09	3.41
	Median	4.00	3.00	3.00	4.00
	Mode	4	1	3	4
Oakley	Mean	3.01	2.06	3.55	3.45
	Median	3.00	3.00	4.00	4.00
	Mode	3	1	4	4

Supervisors' Roles during and after Classroom Observations

In reference to trust, the statistical mean of Otis and Oakley is slightly similar, compared to Ottavia. In Otis and Oakley, the means are 3.16 and 3.35 respectively, stressing that the average response to this statement is neutral. Yet, the mean of Ottavia is 4.09, representing the fact that the average response is agree. Further, the median of Otis and Ottavia is identical, unlike Oakley. On one hand, the middle number in the data set of

Otis and Ottavia is 4; in Otis, the number of teachers who selected strongly disagree, disagree, or neutral is less than those who selected agree or strongly agree. Yet, the number of teachers in Ottavia who selected strongly disagree, disagree, neutral, or agree is equal to those who selected strongly agree. On the other hand, the middle number in the data set of Oakley is 3.05, demonstrating that the number of teachers who selected strongly disagree or disagree is more than those who selected agree or strongly agree. Last, the mode of Otis and Oakley is alike, in comparison to Ottavia; the most frequent response in Otis and Oakley is agree, whereas the most frequent response in Ottavia is strongly agree (see Table 22).

Regarding data, the statistical mean of Ottavia and Oakley is slightly similar, in contrast to Otis. In Ottavia and Oakley, the means are 4.14 and 3.85 respectively, implying that the average response to this statement is agree. However, the mean of Otis is 3.28, signifying that the average response to this statement is neutral. Furthermore, the median across the three schools is identical; the middle number in the data set of the three schools is 4. Although the median is similar across the three schools, it conveys different interpretations for Otis and Oakley, and Ottavia. In Otis and Oakley, the median indicates the fact that the number of teachers who selected strongly disagree, disagree, or neutral is less than those who selected agree or strongly agree. In case of Ottavia, the median shows that the number of teachers who selected strongly disagree, disagree, neutral, or agree is equal to those who selected strongly agree. Last, the mode of schools Otis and Oakley is similar, compared to Ottavia; the most frequent response in Otis and Oakley is agree, yet the most frequent response in Ottavia is strongly agree (see Table 22).

In relation to timely feedback, the statistical mean, across the three schools, is, to some extent, similar; the means of Otis, Ottavia, and Oakley are 3.16, 3.41, and 3.05, signaling that the average response to this statement is neutral. Next, the median of Ottavia and Oakley is similar, in comparison to Otis. In Ottavia and Oakley, the middle number in the data set is 4, stressing that the number of teachers who selected strongly disagree, disagree, or neutral is less than those who selected agree or strongly agree. In contrast to Ottavia and Oakley, the middle number in the data set of Otis is 3, underscoring that the number of teachers who selected strongly disagree, disagree, or neutral is slightly more than those who selected agree or strongly agree. Last, the mode of

Otis and Ottavia is similar, compared to Oakley; the most frequent response in Otis and Ottavia is agree, whereas the most frequent response in Oakley is strongly agree (see Table 22).

Concerning performance feedback, the statistical mean, across the three schools, is slightly similar; the means of Otis, Ottavia, and Oakley are 3.08, 3.18, and 3.35 respectively, emphasizing that the average response to this statement is neutral. Furthermore, the median of Otis and Oakley is similar, unlike Ottavia. On one hand, the middle number in the data set of Otis and Oakley is 4, denoting that the number of teachers who selected strongly disagree, disagree, or neutral is less than those who selected agree or strongly agree. On the other hand, the middle number in the data set of Ottavia is 3, accentuating that the number of teachers who selected strongly disagree, disagree, or neutral is slightly more than those who selected agree or strongly agree. Last, the mode is identical across the three schools; the most frequent response is agree (see Table 22).

As for reflection, the statistical mean of Otis and Oakley is fairly alike, in contrast to Ottavia. In Otis and Oakley, the means are 3.16 and 3.05 respectively, adjudging that the average response to this statement is neutral. However, the mean of Ottavia is 3.82, pinpointing that the average response to this statement is slightly inclined towards agree. In addition, the median is identical across the three schools; the middle number in the data set of all schools is 4, representing the fact that the number of teachers who selected strongly disagree, disagree, or neutral is less than those who selected agree or strongly agree. Similar to the median, the mode is similar across the three schools; the most frequent response is agree (see Table 22).

In respect to instruction, the statistical mean of Otis and Ottavia is, to some extent, similar, unlike Oakley. In Otis and Ottavia, the means are 3.32 and 3.45 respectively, averring that the average response to this statement is neutral. However, the mean of Oakley is 3.75, signaling that the average response to this statement is, to a great extent, drawn towards agree. Additionally, the median is similar across the three schools; the middle number in the data set of all schools is 4, emphasizing that the number of teachers who selected strongly disagree, disagree, or neutral is less than those who selected agree or strongly agree. Last, the mode of Otis and Ottavia is alike, in

comparison to Oakley; the most frequent response in Otis and Ottavia is agree, whereas the most frequent response in Oakley is strongly agree (see Table 22).

In connection to accurate feedback, the statistical mean, across the three schools, is, to some degree, alike; the means of Otis, Ottavia, and Oakley are 3.16, 3.36, and 3.05 respectively, proclaiming that the average response to this statement is neutral. Furthermore, the median diverges across the three schools. In Otis, the middle number in the data set is 3, asserting that the number of teachers who selected strongly disagree, disagree, or neutral is more than those who selected agree or strongly agree. However, the middle number in the data set of Ottavia is 3.5, elucidating that the number of teachers who selected strongly disagree, disagree, or neutral is less than those who selected agree or strongly agree. In comparison to Otis and Ottavia, the middle number in the data set of Oakley is 4, suggesting that the number of teachers who selected strongly disagree, disagree, or neutral is less than agree or strongly agree. Last, the mode is identical across the three schools; the most frequent response is agree (see Table 22).

Table 22

Descriptive Statistics for Statements 5 to 11

		Trust	Data	Timely feedback	Performance feedback	Reflection	Instruction	Accurate feedback
Otis	Mean	3.16	3.28	3.16	3.08	3.16	3.32	3.16
	Median	4.00	4.00	3.00	4.00	4.00	4.00	3.00
	Mode	4	4	4	4	4	4	4
Ottavia	Mean	4.09	4.14	3.41	3.18	3.82	3.45	3.36
	Median	4.00	4.00	4.00	3.00	4.00	4.00	3.50
	Mode	5	5	4	4	4	4	4
Oakley	Mean	3.35	3.85	3.05	3.35	3.05	3.75	3.05
	Median	3.05	4.00	4.00	4.00	4.00	4.00	4.00
	Mode	4	4	5	4	4	5	4

Supervisors' Duties during Post-Observation Conferences

Concerning improvement plans, the statistical mean of Otis and Oakley is nearly similar, compared to Ottavia. On one hand, the means of Otis and Oakley are 2.44 and 2.09 respectively, demonstrating that the average response to this statement is disagree. On the other hand, the mean of Ottavia is 2.77, indicating that the average response is nearly inclined to neutral. In addition, the medians, across the three schools, contrast. In

Otis, the middle number in the data set is 2, highlighting that the number of teachers who selected strongly disagree or disagree is more than those who selected neutral, agree, or strongly agree. However, the middle number in the data set of Ottavia is 3.50, revealing that the number of teachers who selected disagree, strongly disagree, or neutral is less than those who selected agree or strongly agree. In contrast to Otis and Ottavia, the middle number in the data set of Oakley is 3, showing that the number of teachers who selected strongly disagree or disagree is less than those who selected agree or strongly agree. Last, the modes of Otis and Oakley contrast with that of Ottavia. In Otis and Oakley, the most frequent response is strongly disagree, whereas the most frequent response in Ottavia is agree (see Table 23).

As for follow-ups, the statistical mean of Otis and Oakley differs from that of Ottavia. The means of Otis and Oakley are 2.28 and 2.07 respectively, underscoring that the average response to this statement is disagree. Yet, the mean of Ottavia is 2.95, underlining that the average response is slightly drawn towards neutral. Moreover, the median of Otis and Oakley is similar in comparison to Ottavia. In Otis and Oakley, the middle number in the data set is 2, asserting that the number of teachers who selected strongly disagree or disagree is more than those who selected neutral, agree, or strongly agree. However, the middle number in the data set of Ottavia is 3.5, pinpointing that the number of teachers who selected strongly disagree or disagree is less than those who selected neutral, agree, or strongly agree. Last, the mode contrasts across the three schools. In Otis, the most frequent response to this statement is strongly disagree. Yet, the most frequent response in Ottavia is agree, whereas the most frequent response in Oakley is disagree (see Table 23).

In connection with resources, the statistical mean of Otis and Oakley juxtaposes with that of Ottavia. In Otis and Oakley, the means are 2.04 and 2.06 respectively, accentuating that the average response to this statement is disagree. Yet, the mean of Ottavia is 3.6, illustrating that the average response is almost drawn towards agree. Besides, the median of Otis and Oakley is similar, compared to Ottavia. In Otis and Oakley, the middle number in the data set is 2, implying that the number of teachers who selected strongly disagree or disagree is equal to those who selected neutral, agree, or strongly agree. Unlike Otis and Oakley, the middle number in the data set of Ottavia is 4,

stressing that the number of teachers who selected strongly disagree, disagree, or neutral is less than those who selected strongly agree. Last, the mode contrasts across the three schools; the most frequent response in Otis is disagree, while the most frequent response in Ottavia is strongly agree. Yet, the most frequent response in Oakley is strongly disagree (see Table 23).

In respect to improving shortcomings, the statistical mean differs across the three schools. In Otis, the mean is 2.52, attesting that the average response to this statement is disagree. However, the mean of Ottavia is 3.68, contending that the average response is nearly drawn towards agree. In contrast to Otis and Ottavia, the mean of Oakley is 3.05, professing that the average response is neutral. Additionally, the median contrasts across the three schools. In Otis, the middle number in the data set is 2, foreshadowing that the number of teachers who selected strongly disagree or disagree is more than those who selected neutral, agree, or strongly agree. Yet, the middle number in the data set in Ottavia is 4, highlighting that the number of teachers who selected strongly disagree, disagree, or neutral is less than those who selected agree or strongly agree. In comparison to Otis and Ottavia, the middle number in the data set in Oakley is 3, implying that the number of teachers who selected strongly disagree or disagree is equal to those who selected agree, or strongly agree. Last, the mode varies across the three schools. In Otis, the most frequent response is disagree, while the most frequent response in Ottavia is strongly agree. However, the most frequent response in Oakley is strongly disagree (see Table 23).

In terms of professional growth, the statistical mean of Otis and Oakley contrasts with that of Ottavia. In Otis and Oakley, the means are 2.68 and 2.95 respectively, denoting that the average response to this statement is nearly inclined to neutral. Compared to Otis and Oakley, the mean of Ottavia is 3.9, showing that the average response is, to a great extent, drawn towards agree. Also, the median diverges across the three schools; the middle number in the data set of Otis is 2, illustrating that the number of teachers who selected strongly disagree or disagree is more than those who selected neutral, agree, or strongly agree. Yet, the middle number in the data set of Ottavia is 5, indicating that the number of teachers who selected strongly disagree, disagree, or neutral is less than those who selected agree or strongly agree. In contrast to Otis and Ottavia, the

middle number in the data set of Oakley is 3, signifying that the number of teachers who selected strongly disagree or disagree is equal to those who selected agree or strongly agree. Last, the mode differs across the three schools; the most frequent response in Otis is disagree, whereas the most frequent response in Ottavia is strongly agree. However, the most frequent response in Oakley is strongly disagree (see Table 23).

Table 23

Descriptive Statistics for Statements 12 to 16

		Improvement plan	Follow-up	Resources	Improving shortcomings	Professional growth
Otis	Mean	2.44	2.28	2.04	2.52	2.68
	Median	2.00	2.00	2.00	2.00	2.00
	Mode	1	1	2	2	2
Ottavia	Mean	2.77	2.95	3.63	3.68	3.90
	Median	3.50	3.50	4.00	4.00	5.00
	Mode	4	4	5	5	5
Oakley	Mean	2.09	2.07	2.06	3.05	2.95
	Median	3.00	2.00	2.00	3.05	3.00
	Mode	1	2	1	1	1

Supervisors' Tasks during Follow-ups

Regarding effective practices, the statistical mean is nearly similar across the three schools. In Otis, Ottavia, and Oakley, the means are 3.08, 3.45, and 3.45 respectively, revealing that the average response to this statement is neutral. Furthermore, the median of Ottavia and Oakley is similar, in comparison to Otis; on one hand, the middle number in the data set of Ottavia and Oakley is 4, stressing that the number of teachers who selected strongly disagree, disagree, or neutral is less than those who selected agree or strongly agree. On the other hand, the middle number in the data set of Otis is 3, accentuating that the number of teachers who selected strongly disagree or disagree is equal to those who selected agree or strongly agree. Last, the mode of Otis and Ottavia is similar, compared to Oakley. In Otis and Ottavia, the most frequent response is agree, while the most frequent response in Oakley is strongly agree (see Table 24).

In regards to novel techniques, the statistical mean of Otis and Oakley is similar, unlike Ottavia. In Otis and Oakley, the means are 3.08 and 3.07 respectively, showing

that the average response to this statement is neutral. Unlike Otis and Oakley, the mean of Ottavia is 3.95, clarifying that the average response is, to a great extent, inclined towards agree. Moreover, the median, across the three schools, is similar; the middle number in the data set of all schools is 4, underlining that the number of teachers in Otis and Oakley who selected strongly disagree, disagree, or neutral is less than those who selected agree or strongly agree. However, the number of teachers in Ottavia who selected strongly disagree, disagree, or neutral is equal to those who selected strongly agree. Last, the mode of Ottavia and Oakley is similar, compared to Otis. In Ottavia and Oakley, the most frequent response is agree, whereas the most frequent response in Otis is strongly agree (see Table 24).

As for outdated practices, the statistical mean, across the three schools, is almost alike. In Otis, Ottavia, and Oakley, the means are 2.06, 2.45, and 2.04 respectively, underlining that the average response to this statement is disagree. Moreover, the median is identical across the three schools; the middle number in the data set of Otis, Ottavia, and Oakley is 2, demonstrating that the number of teachers who selected strongly disagree is more than those who selected neutral, agree, or strongly agree. Last, the mode of Otis and Ottavia is similar, unlike Oakley. In Otis and Ottavia, the most frequent response is disagree, while the most frequent response in Oakley is strongly disagree (see Table 24).

In reference to accountability, the statistical mean, across the three schools, is slightly similar. In Otis, Ottavia, and Oakley, the means are 3.28, 3.31, and 3.02 respectively, emphasizing that the average response to this statement is neutral. Besides, the median of Otis and Ottavia is identical, in contrast to Oakley. On one hand, the middle number in the data set of Otis and Ottavia is 4, adjudging that the number of teachers who selected strongly disagree, disagree, or neutral is less than those who selected agree or strongly agree. On the other hand, the middle number in the data set of Oakley is 3, underscoring that the number of teachers who selected strongly disagree or disagree is equal to those who selected agree or strongly agree. Last, the mode of Otis and Oakley is equal, unlike Ottavia. In Otis and Oakley, the most frequent response is agree, whereas the most frequent response in Ottavia is disagree (see Table 24).

Table 24

Descriptive Statistics for Statements 17 to 20

		Effective practices	Novel techniques	Outdated practices	Accountability
Otis	Mean	3.08	3.08	2.06	3.28
	Median	3.00	4.00	2.00	4.00
	Mode	4	5	2	4
Ottavia	Mean	3.45	3.95	2.45	3.31
	Median	4.00	4.00	2.00	4.00
	Mode	4	4	2	2
Oakley	Mean	3.45	3.07	2.04	3.02
	Median	4.00	4.00	2.00	3.05
	Mode	5	4	1	4

Chapter 5: Discussion

This chapter concludes the research study, which aimed at describing STEM teachers' views regarding the effectiveness of short visits on their instructional performances. It entails four sub-sections: (a) discussion of the results, (b) key points, (c) recommendations for future research, and (d) implications for teachers.

Discussion of the Results

In this sub-section, teachers' survey responses, across the three schools, are discussed in light of the main research question and sub-questions.

Effect of Short Visits on STEM Teachers' Instructional Performances

Short visits can have a positive effect on STEM teachers' instructional performances provided that they are conducted regularly, are non-pressuring, aim at enhancing the quality of instruction, strengthen teachers' professional development and growth, are conducted after establishing trust, and collect evidence of teachers' instructional practices. Frequency is a main feature of effective classroom visits (Celoski, 2018); supervisors, who sporadically observe teachers' instruction, are collecting "data based on limited information that represent a snapshot of [their] overall abilities" (Boothe, 2013, p. 28). Teachers at Otis and Oakley schools report that they do not receive regular class visits from their supervisors, unlike Ottavia school; teachers believe that their supervisors are hindered from regularly observing them, because of their hectic schedules and administrative duties (Badah et al., 2013). With the absence of frequent classroom visits, teachers are provided with infrequent feedback, which impedes their adult learning processes and obstructs them from effectively executing their duties (Stohlmann et al., 2012).

Frequent classroom observations aim at enabling teachers to comprehend and apply the concept of STEM integration using student-centered pedagogies inside classrooms (Gardner et al., 2019). STEM integration is regarded as "an approach that explores the teaching and learning among any two or more of the STEM subjects and/or between a STEM subject and one or more other school subjects" (Kelly & Knowles, 2016, p. 2). MoE supervisors, during post-observation conferences, support teachers' efforts in implementing integrated STEM education, and provide them with the needed

aid and guidance to design integrated STEM lessons and in-class activities, employ emerging technologies, incorporate effective instructional practices, and increase their content knowledge through training and workshops (Shernoff et al., 2017). Effective application of STEM integration allows students to come up with interdisciplinary solutions involving math, science, and technology to local and global challenges.

Regular class visits "creates a healthy environment, where supervisors and teachers gained a better understanding of one another" (Kubrick, 2015, p. 92); this healthy environment minimizes teachers' anxiety and fear and endorses the idea that classroom observations are non-threatening. Teachers at Oakley school are pressured by classroom visits, unlike Otis and Ottavia schools. STEM teachers feel pressured and threatened by classroom visits because of two central reasons: irregularity of class visits and their negative perception of supervisors (Kubrick, 2015). First, due to irregular classroom visits, teachers "do not develop a sense of trust with the [supervisor] or the feeling that the [supervisor] has a strong understanding of their teaching capacities and routines" (p. 38). Consequently, teachers feel threatened and pressured by classroom observations. Second, some teachers perceive supervisors as inspectors whose key roles are to catch them off-guard and criticize their strategies (Watkins, 2011); therefore, teachers feel uncomfortable with supervisors' presence inside classrooms.

A core ingredient for non-pressuring classroom observations is relational trust (Celoski, 2018). During pre-observation conferences, supervisors establish trust and rapport with teachers in an attempt to eliminate their anxiety and fear. In addition, this relationship of trust empowers supervisors and teachers to work together to promote instructional improvement (Kachur et al., 2010); when this type of relationship is established and nurtured, teachers become comfortable asking for assistance and guidance, less anxious with supervisors' presence inside classrooms, less stressed with supervisors' feedback, more motivated to remedy their own weaknesses, and eager to learn about and adopt innovative instructional pedagogies (Celoski, 2018). Henceforth, classroom observations can be a non-pressuring learning experience for teachers and supervisors once a trusting relationship between both parties is fostered.

Effective classroom visits aim to reinforce appropriate utilization of instructional techniques, engage teachers in contemplative dialogues about instruction, provide them

with comprehensive information about their classrooms, examine their instructional practices, upgrade their aptitudes and performances, and enable them to become self-directed and critical thinkers (Celoski, 2018; Zepeda, 2009). However, the purpose of classroom visits "is not to pass judgment on teachers" (Celoski, 2018, p. 25). Teachers at Otis school believe that classroom visits are conducted with the aim of catching them off-guard, in contrast to Ottavia and Oakley schools. STEM teachers' negative perception of supervision is attributed to the fact that some of MoE supervisors consider themselves as inspectors, rather than mentors or coaches (World Bank, 2016). Accordingly, they "produce hostility and distrust, and [classroom visits] will become a passing fad in the history of school reform" (Celoski, 2018, p. 27).

Improving teachers' use of PBL in STEM education is one of the fundamental aims of classroom visits. PBL, a student-centered strategy, is employed in STEM education to enable students to propose solutions to real-world problems through integrating a broad range of content areas. Yet, "the key to effective PBL is teacher familiarity with the full scope of the design of this teaching strategy including how to incorporate good technological tools" (Miles et al., 2015, p. 2). That is why supervisors, during post-observation conferences, provide teachers with the needed resources and guidance on how to plan lessons while taking into consideration content and pedagogical knowledge, to introduce PBL into their instruction, to use proper technological tools and software inside classrooms, to integrate different syllabi for problem-solving purposes, to connect concepts from one subject through the practice of another, and to build on students' prior knowledge.

Effective classroom visits strengthen teachers' professional development and growth (Snow, 2014; Zepeda, 2009). Teachers, across the three schools, agree that class visits strengthen their professional development and growth. During post-observation conferences, supervisors pinpoint teachers' points of weakness which affect their overall performances and competencies inside the classrooms (Abera 2017; Campbell, 2013; Kramer, 2007; Njeru, 2016; Snow, 2014). As a result, STEM teachers are obliged to participate in professional development to remedy those areas of concern; participating in professional development does not mean attending the training sessions. On the contrary,

it means using "the strategies, skills, and knowledge introduced to improve their instruction and advance their pupils' performances" (Watkins, 2011, p. 61).

Classroom visits focus on developing teachers' content and pedagogical knowledge to better prepare them to teach integrated STEM content (Du et al., 2018). Supervisors, during post-observation conferences, provide teachers with professional development opportunities, such as workshops, conferences, training, and seminars, so that they become comfortable with teaching integrated STEM content. In effect, these professional development platforms are centered on acquainting teachers with integrated STEM pedagogy and strategic planning for activities and research projects, teaching them about STEM curriculum development, training them to utilize technological tools and software properly, guiding them to incorporate real-world problems in their integrated lessons, developing integrated STEM lesson plans using PBL as the dominant pedagogical strategy, and creating a learner-centered classroom culture in which students are engaged in meaningful discussions and group work.

Building trust, one of the fundamental roles of supervisors during pre-observation conferences (John, 2011; Peplinski, 2009; Watkins, 2011), is "crucial in providing an atmosphere, conducive to change" (Spencer, 1985, p. 3). Across the three schools, teachers believe that their supervisors establish a trusting relationship with them before classroom observations. A trusting relationship, which is fostered when supervisors praise teachers' work and exhibit genuine desire to help them improve their quality of instruction, has satisfactory impacts on teachers' performances (Kramer, 2007). First, a trusting relationship that is "kind, emphatic and non-judgmental" (p. 36) entices teachers to learn and improve their shortcomings. Second, when trust is developed, teachers feel more comfortable requesting help and guidance. Finally, a trusting relationship creates positive changes in teachers' behaviors and promotes a culture that class observations are non-pressuring (Kubrick, 2015).

A trusting relationship, characterized by equality, choice, and voice, reinforces teachers' willingness to change their practices (Houston, 2015). First, a trusting relationship highlights the equal nature of the supervisor and teacher where the focus and aim of classroom observations are co-determined by both parties. Second, this relationship empowers the supervisor and teacher to provide input into decision-making

regarding what needs to be improved in their own practices and what needs to be learned. Last, this atmosphere of trust encourages teachers to freely express their honest opinions about the whole learning process. Hence, a relationship of trust minimizes teachers' anxiety and defensiveness during the process and motivates them to become actively engaged in meaningful dialogues about effective instruction (Kennedy & Odell, 2014).

Collecting evidence of teachers' instructional practices is a principal component of effective classroom visits (Zepeda, 2009). Across the three schools, teachers report that their supervisors collect data on their instructional practices during classroom visits. Prior to conducting classroom observations, supervisors choose focus areas or look-fors. "Look-fors describe observable evidences of teaching and learning such as instructional methods, learning activities, behavioral outcomes, artifacts, routines, or practices" (Celoski, 2018, p. 39). Having selected a focus area for classroom observations and a data collection instrument, supervisors are enabled to collect real-time evidence which is crucial to high-quality instruction (Nolan & Hoover, 2010). Besides, supervisors, in post-observation conferences, use observation data to reinforce teachers' effective strategies, promote deliberate practices, and detect their areas of concern (Spencer, 1985).

Collecting data of STEM teachers' instructional practices is of key importance; it ensures their effective use of empirically validated instructional practices that support student learning (William et al., 2015). During classroom observations, supervisors, using a reliable tool, collect evidence of teachers' instructional strategies to guarantee their incorporation of active learning pedagogies, which place an emphasis on students' roles in the learning process; these pedagogies involve PBL, cooperative learning (CL), inquiry-based learning (IBL), and experiential learning. In fact, these pedagogies enable students to make connections between STEM subjects, acquire problem-solving and critical thinking skills, establish relationships between different concepts, form interdisciplinary perspectives regarding notions, build concepts from one subject through the practice of another, and integrate science, technology, and math to address authentic issues (Kennedy & Odell, 2014).

Short Visits and Teachers' Instructional Performances

Short visits can positively impact teachers' instructional performances when STEM teachers are engaged in contemplative dialogues, are provided with constructive

feedback, are guided to construct personalized improvement plans, receive follow-up visits, and are offered resources. First, contemplative dialogues are critical to effective instructional performance (Celoski, 2018). STEM teachers, across the three schools, are allowed to contemplate the collected data with their supervisors. In fact, post-observation conferences empower teachers and supervisors to engage in contemplative dialogues about the data collected during classroom observations (Snow, 2014). In these dialogues, supervisors act as facilitators who assist teachers in analyzing the collected data, rather than telling them what to do; "when [teachers] are told what to do and when and how to do it, with no room for their individual thoughts, there is a very good chance they are not learning at all" (Kubicek, 2015, p. 34). Yet, when supervisors use varied strategies, such as non-judgmental probing questions, teachers become more focused on their teaching styles, develop mature professional identities, and internalize and personalize what they have learned (Kramer, 2007; Rizzo, 2004).

Contemplative dialogues on integrated STEM practices enhance teachers' conceptions and beliefs of integrated STEM approaches (Chitpin, 2010). As "integrated STEM instruction presents various classroom challenges, leading to a resistance toward implementation" (Radloff & Guzey, 2017, p. 2), contemplative dialogues enable STEM teachers to gain a comprehensive understanding of integrated STEM practices by analyzing the collected data during classroom observations and identifying gaps between teachers' actual practices and effective integrated STEM teaching (Shadle et al., 2012). By posing open-ended questions to guide the dialogues, supervisors familiarize teachers with the fundamental aspects of integrated STEM instruction, including developing a driving question or hypothesis about real-world problems, incorporating student-centered teaching methodologies, integrating engineering design principles, embedding standards-based math and science, and fostering teamwork (Radloff & Guzey, 2017).

Second, providing feedback is considered as one of the most fundamental roles of supervisors during post-observation conferences (Watters, 2017). In effect, teachers, across the three schools, are provided with constructive and satisfactory feedback about their instructional performances. Feedback mainly aims at enhancing teachers' instructional performance and effectiveness inside classrooms (Zepeda, 2009). To achieve the aforementioned aim, supervisors' feedback needs to be accurate, evidence-

based, meaningful, considerate in tone, constructive, and non-threatening (Celoski, 2018; Kramer, 2007). When this type of feedback is provided to teachers, they become more motivated to implement change in their practices, feel encouraged to talk openly, and are less defensive and anxious (Nolan & Hoover, 2010).

Feedback assists STEM teachers in modifying and improving their instructional practices (Stearns et al., 2012). Supervisors, during post-observation conferences, use the collected data to engage teachers in guided discussions which focus on enhancing their implementation of PBL in classrooms. Accordingly, teachers are provided with the needed resources, like readings, videos, and online courses, which enable them to effectively incorporate PBL in their instruction; these resources help teachers to develop integrated STEM lesson plans using PBL as the main strategy of instruction, design STEM activities and research projects which focus on real-world problems and incorporate engineering design principles, employ appropriate technological tools, including laser cutters, 3D printers, plasma cutters, shopbots, modella, and vinyl cutters, and act as learning facilitators to guide their students in conducting meaningful research and turning their capstone projects into real prototypes (Celoski, 2018; Miles et al., 2015).

Third, improvement plans (IPs), an essential form of self-directed, goal-oriented professional development, aim at reinforcing teachers' autonomy, empowerment, and accountability (Snow, 2014). STEM teachers at Ottavia school are guided to construct their own IPs to enhance their instructional performance, unlike Otis and Oakley schools. During post-observation conferences, teachers create their own plans, which are then reviewed by their supervisors. While working on their IPs, supervisors act as facilitators, who provide teachers with clear instructions, guidelines, and directions, ratify experimentation, innovation, and creativity, engage them in contemplative dialogues, and encourage them to execute their goals (Fenwick, 2019). Furthermore, IPs, when constructed in a supportive, respectful, and non-judgmental environment, have been attested to endorse life-long learning and professional autonomy, cater to teachers' diverse needs, strengthen their growth and development, promote creativity, and innovation, and encourage self-directed learning (Spencer, 1985).

By creating IPs and meeting the goals, teachers upgrade their instructional performances (Fenwick, 2019). When teachers remedy their instructional weaknesses using IPs, they are able to incorporate an array of learner-centered pedagogies, like PBL, CL, and IBL, integrate proper technological tools and software into their instruction, use integrated STEM pedagogy, engage students in meaningful group work and discussions, design interactive activities and challenging research projects using real-world problems, and build on students' prior knowledge (Williams et al., 2015). Moreover, teachers become more competent when it comes to constructing integrated STEM units, promoting problem-solving and critical thinking skills, possessing a conceptual and foundational understanding of different disciplines, delivering complex notions to a variety of audience, and guiding students in establishing meaningful relationships between concepts across different subject matters (Stohlmann et al., 2012).

Fourth, follow-ups, one of the components of effective classroom visits (Celoski, 2018), are considered crucial to a successful implementation of professional development inside classrooms (Snow, 2014). Teachers at Ottavia school receive follow-ups after incorporating new instructional techniques, unlike Otis and Oakley schools. During follow-up visits, supervisors provide teachers with adequate support, assistance, and guidance, which enable them to cope with the process of change (O'Sullivan, 2002); a change in teachers' instructional behavior is usually a complicated and painful process, which involves fear, anxiety, uncertainty, and apprehension. It "strikes at the core of learned skills, philosophy, beliefs, and conceptions of education and creates doubt about purpose, sense of competence, and self-concept" (p. 185). Accordingly, follow-ups are of key importance in supporting STEM teachers' efforts to transfer professional development inside classrooms (Nwakpa, 2017).

Follow-ups focus on ameliorating STEM teachers' effectiveness and competencies inside classrooms (Lomarak, 2019). One of the most useful strategies for follow-ups is classroom visits (O'Sullivan, 2002). In STEM schools, supervisors conduct unannounced classroom visits after professional development to ensure the transfer of knowledge and skills into classrooms. Then, teachers, during post-observation conferences, are provided with meaningful feedback in relation to integrating appropriate technological tools and software in their instruction, designing STEM activities and

research projects, developing integrated STEM lesson plans, establishing a learner-centered classroom environment, and employing active learning strategies, such as PBL, CL, and IBL which endorse high-order thinking skills, challenge pupils to invent and innovate, help them to establish relationships between different concepts, and make connections between and among STEM subjects (Williams et al., 2015).

Finally, resources, one form of professional development, are offered to teachers at the end of post-observation conferences to remedy their weaknesses, which have been detected during class observations (Rizzo, 2004). STEM teachers at Otis and Oakley schools are not provided with any supplementary resources which help them to enhance their instructional performance and remedy their shortcomings, unlike Ottavia school. In effect, STEM teachers believe that MoE supervisors are impeded from providing them with supplementary resources, including readings, because of several obstacles, such as their hectic schedules, administrative tasks, and inadequate number (Carron & Drauwe, 1997; John, 2011).

Supervisors provide teachers with digital resources, which empower them to better plan integrated STEM lesson plans and deliver their learning objectives using interactive technology (Hanson & Carlson, 2005). To create integrated STEM lessons, teachers are offered with online websites, entailing ready-made lesson plans which have been piloted in real classes, interactive activities, and research topics that involve real-world problems, and best pedagogical practices which cater to students different learning styles. Moreover, supervisors provide teachers with interactive technological applications and software which assist them in delivering their learning objectives and which allow students to possess a strong conceptual and foundational understanding of key concepts within multiple disciplines. For example, intricate processes, including fuel cell, power plants, wastewater treatment, molecular genetics, pig dissection, natural disasters, and 2D collisions, can be easily visualized by students through teachers' use of online applications, like Solar Walk, Nova, Prodigy Math, IXL Math, SAM Labs, Minecraft, Cozmo, and DIY Nano.

Short Visits' Model and Teachers' Use of Research-based Instructional Strategies

The short visits' model can be an effective process for measuring STEM teachers' use of research-based instructional methodologies under certain conditions; these

conditions encompass motivating teachers to utilize effective instructional pedagogies and holding them accountable to use research-based instructional methods. In post-observation conferences, supervisors occupy a key role in upgrading teachers' instructional performance through encouraging them to continue using effective instructional practices, which were incorporated during classroom walkthroughs, and through providing them with professional development, such as seminars, conferences, and workshops, to remedy their instructional weaknesses (Briggs, 1984; Eddings, 2005; Range et al., 2014; Rizzo, 2004; Snow, 2014). Across the three schools, teachers are encouraged to integrate effective instructional practices. Supervisors motivate teachers to effectively utilize empirically validated teaching methods with the aim of improving students' learning and interpersonal skills (Rizzo, 2004).

Incorporating research-based instructional practices has been proven to positively impact STEM students' learning and interpersonal skills (Rasul et al., 2016). Instructional methods, like PBL, CL, and IBL, enable students to identify learning gaps, correct misconceptions, have a strong conceptual and foundational understanding of key concepts, acquire problem-solving and critical thinking skills, conduct meaningful research, establish relationships between central notions and concepts, develop connections between and among STEM subjects, and propose interdisciplinary solutions, involving math, science, and technology, to global challenges (Stohlmann et al., 2012). In addition, these practices equip students with important interpersonal skills, including empathy, teamwork, patience, dependability, responsibility, commitment, cooperation, leadership, active listening, and decision making (Rasul et al., 2016; Sigman, 2019).

Next, effective classroom visits hold teachers accountable to employ effective practices inside classrooms (Sirait, 2016). Teachers at Otis and Oakley schools are held accountable to use effective pedagogies, unlike Ottavia school, because of two key reasons: feedback and regular class observations (Kubicek, 2015). First, supervisors, in post-observation conferences, motivate STEM teachers to continue using instructional practices that were effectively employed during class observations. In addition, they are provided with professional development opportunities to remedy their areas of concern, which were observed during classroom visits, and to upgrade their performances and effectiveness. Hence, feedback "holds them accountable making sure that they use

effective instructional practices that were already in place" (p. 88). Second, classroom visits, which are regularly conducted, hold teachers accountable to use effective instructional practices, which stimulate students to invent and innovate, provide them with interdisciplinary perspectives about different notions, and promote problem-solving and critical thinking to address real-world problems (Sirait, 2016).

"Classroom visits are integral to the accountability process adding value to understanding teaching and learning by providing a lens into the classroom" (Crowe et al., 2017, p. 21). In fact, post-observation conferences, an essential phase in classroom visits, provide teachers with ample opportunities to improve their pedagogies (Hooks et al., 2006); teachers, during post-observation conferences, are offered with digital resources which better enable them to plan integrated STEM units and design interactive activities, and online applications which aid them in delivering their learning objectives. Further, teachers, using open-ended questions, are engaged in contemplative dialogues, allowing them to gain a comprehensive understanding of PBL, technology integration, and integrated STEM practices through analyzing the data collected during classroom visits and identifying the gaps between their observed pedagogies and effective instructional performance (Chitpin, 2010). Last, teachers are offered with professional development opportunities, which match their needs, to ensure proper implementation of PBL, explore new instructional practices, incorporate real-world issues in activities and research projects, learn about STEM curriculum development, and help them to develop integrated STEM lesson plans (Du et al., 2018). Hence, classroom visits "hold teachers responsible for the quality of their classroom provided that they are coupled with adequate training and resources" (Hooks et al., 2006, p. 403).

Key Points

In regards to the main research question and sub-questions, the current study revealed that teachers at Ottavia school viewed the short visits' model as an effective tool not only to improve their instructional performances but also to measure their integration of research-based instructional strategies. Ottavia school teachers agreed that their supervisors collect evidence of their instructional practices, provide them with clear feedback, construct IPs to alter their instructional performances, conduct follow-ups, provide them with supplementary resources to improve their performances, engage them

in contemplative dialogues, and motivate them to employ effective instructional pedagogies. In effect, teachers' views of the short visits' model at Ottavia school are in line with Zamary's study (2012) which concluded that mini-observations impact teachers' instructional performances positively and are an accurate tool for assessing the use of research-based instructional strategies.

In contrast to Ottavia school, the present study unveiled that teachers at Otis and Oakley schools perceived the short visits' model as an ineffective tool to enhance their instructional performances and to measure their incorporation of research-based instructional strategies. Teachers at Otis and Oakley schools believed that their supervisors do not form IPs to adjust their instructional performance, conduct regular follow-up visits, and provide them with resources to boost their performances. In fact, teachers' views about the short visits' model at Otis and Oakley schools are consistent with Atkinson's and Bolt's study (2010) which posited that mini-observations marginally impinge teachers' instructional performances when they are not provided with ongoing follow-ups and professional development opportunities.

Limitations

Similar to any research, there are several limitations to this study. To begin with, the research participants were chosen using convenience sampling. Thus, the researcher "cannot say that the [participants] are representative of the population" (Creswell, 2012, p. 145). Yet, the participants provided insightful information about the effects of the short visits' model on their instructional performances inside classrooms.

Besides the sampling technique, the data collection tool is "limited to the responses given and the time every respondent puts into his or her answers" (Peplinski, 2009, p. 134). Some teachers might have accurately answered all the survey questions, while others might have answered them quickly and, accordingly, provided little information regarding the impacts of the short visits' model on their instructional performances.

Finally, this study was limited to a survey of 67 STEM teachers who were selected from three Egyptian public schools: Otis, Ottavia, and Oakley schools. So, the study's results cannot be generalized to the overall population of STEM schools due to the small sample size.

Recommendations for Future Research

Based on the results of the current study, several recommendations were proposed for future research. First, as this study was limited to a survey of 67 STEM teachers, future research should select larger sample size. According to Creswell (2012), selecting large sample sizes provides a good estimate of the characteristics of the target population, minimizes the potential of sampling errors, and allows for the generalizability of the results to the rest of the population.

Second, survey research which is mainly used to describe trends, determine people's attitudes, and highlight individual opinions (Creswell, 2012) was employed in this study to describe STEM teachers' views about the effectiveness of the short visits' model on their instructional performances. Hence, future research should consider using a qualitative or mixed methods approach to investigate the reasons behind the ineffectiveness of the short visits' model on teachers' instructional performances at Otis and Oakley schools.

Third, three Egyptian STEM schools: Otis, Ottavia, and Oakley schools were included in the current study; these schools are located in Giza, Cairo, and Qalyubia governorates respectively. Henceforth, future research should take into account the remaining STEM schools, positioned in disparate governorates across Egypt, such as Alexandria, Kafr El-Sheikh, Dakahlia, Assiut, Luxor, Red Sea, Ismailia, and Gharbiya.

Finally, this study was limited to STEM schools, public secondary schools consisting of three grade levels: 10, 11, and 12. Therefore, future research should consider collecting data regarding the effectiveness of the short visits' model on teachers' instructional performances in middle and elementary schools in Egypt using a qualitative or mixed-methods approach.

Implications for Teachers

Based on the results of the current study, teachers at Otis and Oakley schools perceived the short visits' model as an ineffective tool to improve their instructional performances because it lacks three essential components: follow-ups, resources, and IPs. First, follow-up visits are fundamental to effective instructional performance. During follow-ups, supervisors provide teachers with adequate help, support, and guidance to

enable them to cope with the process of change (O'Sullivan, 2002). In fact, the process of change is deemed painful and complicated and involves terror, anxiety, and apprehension, because it "strikes at the core of learnt skills, philosophy, beliefs, and conceptions of education" (p. 185). Thus, follow-ups are of key importance in supporting teachers' efforts to transfer professional development inside classrooms. However, with the absence of follow-ups, teachers have numerous opportunities to revert to outdated practices under a new name.

Second, resources, one form of professional development, are of fundamental importance to STEM teachers (Gardner et al., 2019). Professional development opportunities enable teachers to enhance their content and pedagogical knowledge, integrate technology skillfully in classrooms, incorporate innovative teaching practices, offer quality instruction, design challenging activities, deal with different capacities and abilities, and engage different types of learners (Shernoff et al., 2017). Further, effective professional development empowers STEM teachers to deepen students understanding of the targeted subject, create a safe learning environment, clarify misconceptions, foster cooperation, and provide them with interdisciplinary perspectives about concepts (Gardner et al., 2019). Yet, failing to provide STEM teachers with professional development opportunities, which match their needs, results in poor content delivery and assessments, weak pedagogical and content knowledge, under-prepared teachers, and low student performance (Ejiwak, 2013).

Finally, IPs, one form of self-directed professional development, aim at ameliorating teachers' areas of concern and increasing their autonomy and accountability (Ziegler, 2019). When IPs are constructed in a respectful, supportive climate, they stimulate teachers' growth and development, encourage creativity, experimentation, and innovation, skyrocket professional accountability and autonomy, and promote life-long learning (Ejiwak, 2013; Ziegler, 2019). Yet with the absence of a plan, which pinpoints and remedies the gap between the required and actual performance, weak teacher performance, portrayed in poor planning and preparation, poor content and pedagogical knowledge, and inadequate instruction, is an inevitable repercussion (Ejiwak, 2013).

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Appendix A: Data Collection Tool

Demographic Data:

Gender:

Age:

Years of Experience:

Subject Taught:

Highest Degree Earned:

Statements	SA 5	A 4	N 3	D 2	SD 1
1- My supervisor conducts regular classroom visits.					
2- Classroom visits are conducted to catch teachers off-guard.					
3- Unannounced classroom visits put me under pressure.					
4- Classroom visits strengthen my professional development and growth.					
5- My supervisor establishes a trusting relationship with me.					
6- My supervisor collects evidence of my instructional practices during classroom visits.					
7- My supervisor provides me with timely feedback after classroom visits.					
8- My supervisor provides me with feedback about my instructional performance.					
9- I am allowed to reflect on the feedback with my supervisor.					

10- I change my teaching style according to my supervisor's feedback.					
11- My supervisor's feedback is constructive and satisfactory.					
12- My supervisor creates an improvement plan to adjust my instructional performance.					
13- My supervisor conducts follow-up visits after implementing new instructional strategies.					
14- My supervisor provides me with resources to enhance my instructional performance.					
15- The resources help me to improve my shortcomings.					
16- The resources contribute to my professional growth and development.					
17- My supervisor motivates me to integrate effective instructional practices.					
18- I am encouraged to employ new teaching techniques inside the classrooms.					
19- My supervisor urges me to incorporate teaching practices which emphasize memorization of facts.					
20- Classroom visits hold me accountable to employ effective instructional practices.					

Adapted from Kubicek's Classroom Walkthrough Observation Process Model (2015)

Appendix B: NIH Training

Certificate of Completion

The National Institutes of Health (NIH) Office of Extramural Research certifies that **Gelan Hesham** successfully completed the NIH Web-based training course "Protecting Human Research Participants".

Date of completion: 09/16/2018.

Certification Number: 2496424.

Appendix C: Consent Form

Project Title: Teachers' Views about the Effectiveness of Short Visits on their Instructional Performance

Principal Investigator: Gelan Hesham Abdou Ahmed, Gelan@aucegypt.edu, 01093054903

The Purpose of the Research: To describe teachers' views in relation to the effectiveness of short visits on their instructional performance and the results may be presented in academic conferences.

The Expected Duration of Participation: 30 minutes

The procedures of the research will be as follows: I will meet with the schools' principals to familiarize them with the aim of the current study and the data collection tool. Then, I will request each principal to conduct a faculty meeting during which I will acquaint the teachers with the purpose of the study and its importance to their instructional performance. Also, I will stress the fact that they can refuse to take part in the study without any penalty, that the data are not to be accessed by an external party, and that their total anonymity is not to be compromised.

Signature: _____

Date: _____

Appendix D: IRB Approval of Study

CASE #2019-2020-059

THE AMERICAN UNIVERSITY IN CAIRO
INSTITUTIONAL REVIEW BOARD

To: Gelan Hesham

Cc: Dena Riad

From: Atta Gebril, Chair of the IRB

Date: Jan 19, 2020

Re: Approval of study

This is to inform you that I reviewed your revised research proposal entitled **"Teachers' Views about the Effectiveness of Short Visits on their Instructional Performance"** and determined that it required consultation with the IRB under the "expedited" category. As you are aware, the members of the IRB suggested certain revisions to the original proposal, but your new version addresses these concerns successfully. The revised proposal used appropriate procedures to minimize risks to human subjects and that adequate provision was made for confidentiality and data anonymity of participants in any published record. I believe you will also make adequate provision for obtaining informed consent of the participants.

This approval letter was issued under the assumption that you have not started data collection for your research project. Any data collected before receiving this letter could not be used since this is a violation of the IRB policy.

Please note that IRB approval does not automatically ensure approval by CAPMAS, an Egyptian government agency responsible for approving some types of off-campus research. CAPMAS issues are handled at AUC by the office of the University Counsellor, Dr. Ashraf Hatem. The IRB is not in a position to offer any opinion on CAPMAS issues, and takes no responsibility for obtaining CAPMAS approval.

This approval is valid for only one year. In case you have not finished data collection within a year, you need to apply for an extension.

Thank you and good luck.

Atta Gebril

Dr. Atta Gebril
IRB chair, The American University in Cairo
2046 HUSS Building
T: 02-26151919
Email: agebril@aucegypt.edu

Appendix E: CAPMAS Approval

الجهاز المركزى للتعبئة العامة والإحصاء

القيـــد :١١٧٧ الموضوع :

التاريـــخ : ٢٠٢٠ / ١ / ٢٩ المرفقات :

السيد الأستاذ الدكتور/ مستشار الجامعة الامريكية بالقاهرة

تحية طيبة وبعد ،،،

بالإشارة لكتاب سيادتكم ومرفقاته الوارد للجهاز في ٢٠٢٠/١/٢٧ بشأن طلب الموافقة علي قيام الباحثة / جيلان هشام عبده أحمد - المسجلة لدرجة الماجستير / بقسم القيادة التربوية كلية الدراسات العليا فى التربية / الجامعة الامريكية بالقاهرة بإجراء دراسة ميدانية بعنوان:(آراء المعلمين بمدارس المتفوقين للعلوم والتكنولوجيا بخصوص تأثير الإشراف على فعاليتهم التعليمية) .

وذلك وفقا للإطار المعد لهذا الغرض.

يرجى التكرم بالإحاطة بأن الجهاز المركزي للتعبئة العامة والإحصاء يوافق على قيام الباحثة / جيلان هشام عبده أحمد - بإجراء الدراسة الميدانية المشار إليها بعالية وفقا للقرار رقم (١٢٢٩) لسنة ٢٠٢٠/٢٠١٩ اللازم في هذا الشأن وعلى إن يوافى الجهاز بنسخة من النتائج النهائية كاملة فورالانتهاء من إعدادها طبقا للمادة رقم (٧) من القرار.

وتفضلوا بقبول فائق الاحترام ،،،

مجدى محمد جاد
القائم بأعمال
مدير الادارة العامة للأمن