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Master Teachers and Department Heads as Science Instructional Leaders: A Case Study on Their Role as Instructional Programme Managers

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Abstract

As instructional leaders, master teachers and department heads are equally important in harnessing commendable scholastic performance for both teachers and students. This paper explored the case on how science master teachers and department heads practice on science instructional leadership, thereby creating an in-depth description and analysis of their ideals and realities. An electronic open-ended survey questionnaire and semi-structured individual interviews with six participants were used to collect data. Findings revealed that the practices of master teachers and department heads on coordinating the science curriculum dimension include fostering professional development among science teachers, providing technical assistance to science teachers, and organizing programs, projects and activities related to science**.** Meanwhile, ensuring instructional competence of science teachers and performing classroom observation as prescribed by Department of Education are their practices under supervising and evaluating science instructions. For monitoring student's progress, participants' practices include focusing diverse assessment strategies towards science process skills. This study also unveiled that the participants faced dilemma in their role as instructional leaders because of additional tasks aside from the prescribed duties and responsibilities of science master teachers and department heads expected from them. Moreover, documentary analysis disclosed that the instructional leadership of science master teachers and department heads significantly influences the school performance. Further study on the relationship between instructional competence of school leaders to its performance indicators is warranted.

Keywords: science instructional leaders, managing instructional programmes

Introduction

Societal dynamics necessitate adaptive measures in promoting knowledge, skills and applicability. Thus, in order to provide society with adaptable and life-long learners, the education sectors must catch up to these demands. One profound consideration in realizing these demands is the thorough and functional practice of instructional leadership across levels of the educational arena. Congruently, refining and cultivating instructional processes does not only revolve through the leadership of the school principals but also the distributed efforts across designated personnel such as department heads and master teachers (Spillane & Diamond, 2007; Spillane, Diamond, & Jita, 2003). Master teachers' and department heads' instructional leadership practices are far more relevant than those of the principals. Thus, examining these practices can provide input to the improvement of the way education is delivered to its important clientele – the students.

True enough, a number of authors (Dania & Andriani, 2021; Day, *et al.*, 2016; Hallinger & Heck, 2010; Hallinger &

Hosseingholizadeh, 2019; Harris, *et al.*, 2019; Manaseh, 2016; Moeketsane, *et al.*, 2021; Munna, 2021; Spaull, 2013; Spillane & Zuberi, 2009; and Wood & Olivier, 2008) highlighted that instructional leadership is important, suitable, and strongly felt to have promoted the improvement the school's and student's performance. Additionally, Weller (2001) suggested that master teachers and department heads are in a good position to promote instructional advancement due to their constant interaction with teachers and because of their instructional expertise.

However, to reinforce the instructional leadership skills and competency of the master teachers in the Division of Biliran, a development plan must be created (Laude, *et al.*, 2018). Manaseh (2016) argued that programs aimed at enhancing school leaders' capacities should put a particular emphasis on introducing them to the instructional leadership model and preparing them to supervise instructional modifications that would improve all students' levels of learning. Furthermore, follow-up research concentrating on teachers' instructional leadership should also be conducted to evaluate the impact of the inputs, according to the study Malitic (2020).

Munna (2021) emphasized that although the field of instructional leadership has been treated seriously, there is hardly any academic literature and no suitable guidance for carrying out the function of science instructional leadership. In order to strengthen instructional leadership in schools even when senior administrators are not present and to get subject leaders ready for success as senior managers in the future, Moeketsane, *et al.* (2021) recommended that subject leaders be completely integrated into instructional leadership programs. In conjunction with, since science instructional leaders are expected to provide administrative support to the program with attention for science laboratory activities in addition to the typical pedagogy, assessment, and curriculum improvement on the components of science, they may provide extra obstacles and challenges. Other than this, the high-stake assessments such as the Program for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS) results revealed disappointing results (Raya, 2021). Another issue is the frustrating results of the national achievement test for science. The instructional leadership practices used by department heads and master teachers in science may be accountable for these shortcomings and predicaments.

Thus, it is important to study master teachers' and department heads' practices in order to prepare them to carry out their responsibilities and functions, given the significant role they play in achieving the educational system's goals. Furthermore, despite the plethora of literature on instructional leadership, there are only few studies that highlight the science instructional leadership practices and challenges encountered by science instructional leaders in basic education within the realities in the Philippine schools. As a matter of fact, in the Philippines, the principals of the basic education schools are the main subjects of the most studies on instructional leadership (Arrieta *et al.*, 2020; Basañes, 2020; Bush *et al.*, 2016; Cahapay, 2022; Gamata, 2021; Laude *et al.*, 2018; Lincuna & Caingcoy, 2020; Malitic, 2020; Mendoza & Bautista, 2022; Pitpit, 2020; Sindhvad, 2009; Villa & Tulod, 2021) and it appears that science instructional leadership practices and roles of the master teachers and the department heads are unnoticed and snubbed. Peacock (2014) also argued that additional exploration and investigation is needed to specify the roles of Science Department Chairs such as Master Teachers and Head Teachers in science instructional leadership.

This study explored the practices of science master teachers and science department heads on Instructional Leaders using Hallinger and Murphy's (1985) Instructional Leadership Model specifically on "Managing Instructional Program"

dimension as a conceptual lens. In this model, there are three dimensions in instructional leadership activities, namely determining school missions, managing instructional programmes, and creating school learning environments. The managing instructional programs dimension, which includes working with teachers on topics pertaining to curriculum and instruction, is the focus of this study. This dimension includes three sub-dimensions such as supervising and evaluating instruction, coordinating curriculum, and monitoring student progress. Providing teachers with instructional assistance, monitoring classroom instruction through a variety of casual classroom visits and matching the classroom objectives of teachers with those of the school are all parts of supervising and evaluating instruction. In coordinating curriculum, practices ensuring and guaranteeing the continuity of learning objectives for each grade that are directly connected to the material covered in class and in achievement exams are involved. Monitoring student progress includes giving teachers test results in a timely and helpful manner, talking with teachers about test results, and giving teachers interpretative analysis that succinctly summarizes the test data. However, as noticed, this model offers a general view of instructional leadership practices, hence, in this study, the context of science instructional leadership is specified.

Thus, the following research questions were asked in this study: (a) What are the practices of science master teachers and department heads in assuming their duties and responsibilities as instructional leaders in managing instructional programs?, (b) How are these practices different from the existing science instructional leadership standards on managing instructional programs?, and (c) Will these science instructional leadership practices on managing instructional programs affect the school performance?

Methodology

Research Design

This qualitative study employed a case study approach to explore and develop an in-depth description and analysis of the practices of science instructional leaders on managing instructional programs. According to Creswell (2013), a case study involves collecting detailed, comprehensive data over time from multiple sources of information about one or more cases. Through analysis of the data from multiple sources of information, in-depth understanding is provided through themes and issues identified by the researchers. Aside from the interviews with the key informants, we also evaluated relevant documents provided by the participants to provide a better and in-depth description of each case.

Participants and Sampling

For this study, we purposefully selected six participants from the public secondary schools in the Schools Division of the City of Meycauayan. Each participant currently holds a science instructional leadership role, serving as either a science master teacher or a science department head/chair for more than two years. They were asked to participate in this study and willingly agreed to partake in this endeavour as evidenced by their signed informed consent document.

Data Collection

We obtained approval and permission from the Schools Division Office of the City of Meycauayan to include science master teachers and department heads as study participants. Once we received their acceptance letter, we provided all participants with an informed consent document outlining the study's details and obtained their voluntary consent to participate. To gather the necessary data, we developed semi-structured interview questions and administered them to participants either face-to-face or via virtual conference platforms, depending on their preference. This interview format known as the "semi-structured interview" has become the most popular method for gathering qualitative data (DiCicco-Bloom & Crabtree, 2006). A semi-structured interview is a qualitative research technique that involves a

prepared list of open-ended questions, but also allows for researchers to explore specific responses in greater depth. This approach enables the researchers to ask follow-up questions for clarification. In this study, the semi-structured interview questions were designed to elicit information on the participants' practices in enacting science instructional leadership roles, with a specific focus on managing instructional programmes.

Data Analysis

We utilised MS Excel to analyse the data collected and employed the thematic analysis framework proposed by Braun and Clarke (2006). This six-phase method provided a valuable framework for conducting our analysis. We read and reread the transcripts in the first stage to familiarise ourselves with the data. By creating initial codes, we arranged our data in a sensible and methodical manner. Third, when we looked over the codes, some of them clearly fitted together to generate preliminary themes. The basic themes that we had discovered were revised, improved, and developed in the following phases so that they are now well-defined and capable of supporting interpretations and conclusions.

Ethical Considerations

The researchers have taken steps to comply with data management protocols, beginning with the collection, storage, and analysis of data. Participants were fully informed and provided with guidance on their involvement in the study through the informed consent document, which they signed. The information gathered was treated with the utmost confidentiality, privacy and anonymity. The research participants received no remuneration or other financial benefits in exchange for taking part.

Results and Discussion

In this section, findings of this research exploration are specified according to the main themes and sub-themes based on the conceptualisation of Hallinger and Murphy's (1985) instructional leadership model specifically on "managing instructional programs" dimension. From the six participants who consented to participate in this study, in which saturation point has been achieved and the researchers noticed that continued data collection produces no new insights about the topic being studied, the following presents the contextualised themes focused on science instructional leadership practices.

1. Coordinating the Science Curriculum

a. Fostering Professional Development among science teachers.

Science master teachers and department heads ensure that their science teachers are always up to date with the current and existing DepEd national science curriculum. Science teachers are provided with opportunities to be well-informed about curriculum policy reforms by attending national, regional, and division orientations. Science master teachers and department heads also lead their teachers in participating in training and seminars that can enhance their teachers' pedagogical skills aligned to the demand of the science curriculum. One of the participants mentioned: "*I always encourage my science teachers to attend relevant training/ seminar workshops or even free webinars to improve their craft."* In accordance with the study presented by Malinga, Jita and Bada (2021), instructional leaders are capable of seeking out relevant areas on how to foster professional growth practices. Instructional leaders encourage their science teachers to engage in career development and improvement of teaching practices (Clandinin *et al.*, 2016).

b. Providing Technical Assistance to science teachers

Science curriculum is significantly related to the instructional leadership of master teachers and department heads. By conducting classroom teaching observations and evaluating teachers' performance and outputs, science instructional leaders lead the schools in improving teaching practices aligned with the science curriculum policies and through the provision of technical

assistance for their colleagues (Laude *et al.*, 2018).

Science master teachers and department heads regularly and continuously conduct instructional leadership activities centred on the provision of technical assistance for their subordinates. They make sure that they are always ready to give relevant professional suggestions and advice whenever needed. With the essence of their responsibility as technical assistance provider, as Moore (2015) stated, science instructional leaders (master teachers and department heads) are the core component of making sure that the curriculum is effectively implemented on a daily basis to guide all the science teachers through administering technical assistance.

c. Organising programmes, projects and activities related to science

As instructional leaders, science master teachers and department heads are also designers of science-related programs and activities. Participants cited how they commenced several programs and projects related to science context such as In-Service Training for Teachers (INSET), school science fair, science exhibits and expos, science career guidance programs.

Congruent with the Framework for Philippine Science Teacher Education, master teachers and department heads as instructional leaders plan the training programs. This should be based on the expressed needs of and in consultation with classroom teachers, which can define the context of the school addressing specific target/s or issue/s (SEI-DOST & UP NISMED, 2011). Being submerged into the situation, master teachers and department heads know the immediate problem that requires a viable solution through these training programmes.

Aside from the training, science master teachers and department heads also initiate another move to conduct the clustered Learning Action Cell (LAC) sessions. These Science LAC sessions are intended for the department to guarantee that all instructional decisions are based on the framework of science education. This is also conducted to address challenges in the working environment, professional growth, and upskilling and pedagogical knowledge (Vega, 2020).

2. Supervising and Evaluating Science Instruction

a. Ensuring Instructional Competence of science teachers.

Part of the responsibilities of science master teachers and department heads is to monitor that instructional duties are properly prepared and executed by the teachers. Participants perform regular checks of the lessons plans and instructional materials prepared by teachers. This becomes an avenue for collaboration as the instructional leaders provide key points to improve and conduct coaching sessions to update the teachers' instructional competencies.

Similar to the research done by Mendoza and Bautista (2022), instructional leaders provide their subordinates with significant technical assistance, mentorship, advice, and act as role models so that teachers will perform better and are more competent in their teaching. Science master teachers and department heads are competent in terms of curriculum content and pedagogy, so through coaching sessions, their teachers can enhance their instructional competence as well as their mastery of the subject matter, teaching strategy, classroom management and evaluation.

b. Performing Classroom Observation as prescribed by DepEd through RPMS-PPST

The national adoption of the Result-based Performance Monitoring System (RPMS) aligned to Philippine Professional Standards for Teachers (PPST) of DepEd ensures the quality delivery of accessible, relevant, and liberating education across the country. This is a mandate to effectively provide a systematic mechanism to manage, monitor and measure teaching performance for continuous work improvement and individual growth.

Science master teachers and department heads safeguard how efficient instruction is implemented in every classroom by

conducting classroom observations in relation to RPMS-PPST. Since 2015, instructional leaders have observed classroom teaching practices against the identified key results area and objectives by the RPMS-PPST (Clariño, 2020).

All the participants said that they are observing the classes of their science teachers to assess the strengths and weaknesses of their teaching practices (Sofianidis & Kallery, 2021). Scheduled classroom observations are common to all of them, and it's noted that the need to undertake a number of classroom observations in a given grading period depends on the prescribed number of classroom observable objectives designed by RPMS-PPST.

In addition, participants also said how mentoring sessions are conducted before and after the classroom observations. As this mentoring and support system offers substantial impact to teachers (Zuniga, 2020), instructional leaders need to be equipped with effective mentoring skills to promote a culture of competence and collaboration.

3. Monitoring Student's Progress

a. Focusing Diverse Assessment strategies towards Science Process Skills

The highlight of today's science curriculum is on the focus of how learners can be able to gain science process skills (SPS) and ultimately use them towards everyday living (Sıbıç & Acar Şeşen, 2022). Science master teachers and department heads who are specialised on the subject matter and expert at content knowledge, are effective instructional leaders who can guide their subordinates towards the utilisation of assessment strategies rich with science process skills such as inquiry-based exploration and problem solving (Ismail *et al.,* 2018).

Results from data collection revealed that science master teachers and department heads guide their science teachers to use assessment strategies that will enhance the skills of learners in terms of *observing, classifying, measuring, communicating, inferring, and predicting*. Identified assessment strategies focused on science process skills include performance-based tasks, alternate assessments, and authentic assessments. As instructional leaders, science teachers are advised to begin adapting alternative and adjunct strategies or tools in measuring and evaluating the level of SPS proficiency among students (Santos & David, 2017).

Dilemma of Science master teachers and department heads as Instructional Leaders

All the participants share a commonality when it comes to having additional tasks aside from the prescribed duties and responsibilities of science master teachers and department heads. These ancillary assignments include administrative tasks and/or non-science related responsibilities such as being the class advisers, coordinators, committee members, school clinicians, and project leaders.

Though they perceive that these additional duties can be an opening to further improve their instructional leadership skills, sometimes, they create a barrier against implementing effective and quality instructional leadership practices. The dilemma is aggravated by the ambiguity of roles they assume in everyday situations.

Effects of science instructional leadership practices to school performance

Document analysis unveiled how instructional leadership of science master teachers and department heads significantly influences the school performances. Several pieces of evidence that match instructional leadership skills of the participants to students' academic achievement, science teachers' teaching practices and career development, and to the effective accomplishment of the school's vision and mission are presented as follows.

The impact of instructional leadership on the growth rate of achievement in secondary schools was examined by Hou *et al.* (2019). Their findings have shown that a more competitive instructional leadership expedites students' progress in academic success. It can be noticed that the participants as instructional leaders do have an influence

on how learners competitively get admitted into states, universities, and colleges because of considerable academic achievement. On top of this, the influence suggests that outstanding students with higher accomplishments are extremely driven and have better prospects in their individual institutions, where there is an exceedingly competitive learning environment. Proofs of these are the achievements earned by the learners such as competition awards from school to international levels, scholarships grants (DOST-SEI, government-funded, NGOs), and academic excellence awards during the commencement exercises.

On the part of teachers, instructional leadership enacted by their science master teachers and department heads contributes to their teaching practices. The study by Skelton (2019) presents the idea of how the execution of instructional leadership tasks, notably through the conceptualization and communication of a school mission and school goals, influences teachers' organizational commitment. Effective instructional leadership will create a positive working environment and foster professionalism and instructional empowerment and competence among the teachers. This can be the basis for the improved teaching practices and self - efficacy of teachers for their "outstanding teaching performance" based on their Individual Performance Commitment and Review Form (IPCRF) rating for RPMS-PPST. Majority of the science teachers from the identified schools are given the recognition because of their exemplary works in teaching which can be indirectly inspired by the instructional leadership assistance they have received (Cansoy & Parlar, 2018).

Lastly, science instructional leadership enacted by the master teachers and department heads can be acknowledged for the overall school outcomes. It can be argued that instructional leaders can have their imprints and be correlated positively with performance of the school (Siddiqui *et al.*, 2019). Managing the curriculum programs can help achieve the objectives of the school. Supervising and monitoring teaching and learning in schools can bring enhancement to student learning, and thus school performance. Interesting indicator of the overall school performance is the School-Based Management (SBM) practices, in which all of the participating schools have earned the highest Level III.

Conclusion and Recommendations

As science education continues to evolve and teachers encounter major overhauls on science curriculum, pedagogy, and assessment, science instructional leaders in the person of master teachers and department heads need to demonstrate science instructional and professional competence and support science teachers to adapt to societal dynamics.

With the paucity of research undertaken about the instructional leadership roles of science master teachers and department heads, this study has shown significant strides to account the efforts of instructional leaders in supervising and evaluating instruction, coordinating science curriculum, and monitoring student progress.

Findings of the study demonstrate practices that allow instructional leaders to manage the curriculum programs in schools by providing teachers with instructional assistance, monitoring classroom instruction, ensuring continuity of learning objectives, and managing student progress aligned to science process skills. Despite the ambiguity of the roles in the instructional leadership in schools, and even the additional ancillary tasks handed over to science master teachers and department heads, these practices are identified to provide significant contributions to the students' academic achievement, teacher's professional and teaching career growth, and the entire school's performance. By maintaining learning environments that have a favourable impact on teaching outcomes, effective science instructional leaderships roles are essential for engaging,

empowering, and supporting high-quality teachers.

The findings present an initial insight into how instructional leadership practices of school science master teachers and department heads can be delved into and influence the school teaching outcomes. However, further study on the relationship between instructional competence of school leaders to its performance indicators is warranted.

Future research could include expanding the scope to reach more additional inputs on school instructional leadership practices. It is also worthwhile to investigate the other dimensions of the instructional leadership framework of Hallinger and Murphy (1985) to extend the understanding of other types of leadership practices and their prediction of performance indicators.

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