Science Teachers' Perspective on Head of Science Panels (HOSCP) Leadership Competency in Malaysia

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Abstract

The wave of educational reform in the global world is the impact of the process of development of science and technology over the past two decades. Education reform has led to changes in the education system and climate taking place globally. This places the role of the Head of Science Panel (HoSP) as a key change agent to develop its leadership competencies to be able to improve the quality of teacher teaching in improving student achievement in scientific literacy should be implemented. This study aims to identify problems in the leadership competencies of Head of Science Panels (HoSPs) based on the needs of leadership competencies that include knowledge and leadership skills based on key areas of task specification and values of professionalism as core competencies to Head of Science Panels (HoSPs) in perform its duties effectively. Based on the analysis of the questionnaire, the problems in the context of competence to be exemplary based on leadership skills are at a moderate level. The context of competence in leading leadership by applying curriculum management is a less problematic leadership competency based on the perspective of Science teachers in Malaysia.

Keywords: Science, teachers, leadership competency, head of science panel.

Introduction:

The second wave of the Malaysian Education Blueprint (MEB) (2016-2020) established new career routes and progression programmes to assist the shift to a distributive leadership model incorporating senior and middle leaders. This action is intended to assist top leadership in schools, such as school leaders and senior leaders, in creating more effective school administration. The leadership of teachers in their departments who have a mission and vision that emphasises student achievement have an impact on the quality of teaching and learning of teachers [1] - [3]. This highlights the Head of Subject Panels' function in the school as a leader to the teachers in his department as a key agent in increasing the quality of teacher instruction, which leads to improved student achievement. Previous research has found that teacher leaders can lead schools through enhanced teacher collaboration, communicate best practises, promote teacher professional learning, and help based on various challenges in subject matter [4], [5]. This endeavour is bolstered further by the fifth shift execution of the 2013-2025 MEB strategy, which aims to ensure that every school in Malaysia has high-quality leaders [6]. According to the Malaysian Ministry of Education (MoE) (2013) [6,] the ministry will ensure that high performing school leaders are put in each school, and he will be assisted by a competent team of middle leaders comprised of Head of Subject Departments and Head of Subject Panels. This goal is to develop an effective school instructional leadership team capable of driving school performance to an extraordinary level.

The challenge for today's school leaders is to continually improve their level of leadership in response to changes in the field of education, as well as the country's and the world's progress in general [7]. High-performing school systems have also changed from heroic leadership to

distributive leadership, according to previous research [6]. The senior leaders and middle leaders, such as the Head of Department (HoD) and the Head of Subject Panel (HoSP), now have additional power to make decisions in schools. As a result, the HoSP position as an executor who softens the top leaders' instructions should be given attention and activated. The idea of leading from the middle level has arisen as a reform strategy in leadership systems where the function of middle leaders is seen as very significant, according to Harris and Jones [8]. In order to attain higher performance improvement, Fullan [9] contends that leadership from the middle provides increased capacity and more effective internal relationships between top leaders and followers at the school and community levels. As a result, research needs analysis was undertaken to corroborate the existing challenges and enhance the results on the need for for the establishment of a specialised leadership competency model for the position of Head of Science Panels (HoScP) in Malaysia. Based on the study's findings, it is evident that there are issues with HoScP leadership competencies in Malaysia, according to science teachers and experts. The development of a HoScP leadership competency model is important, based on the perspectives of science teachers and experts.

Background of the Study:
School leaders are constantly challenged with managing human resources, time, and finances in terms of developing the school while also improving the quality of teaching and learning [10]. Several leadership models and competency standards have been developed in the context of leadership and the role of HoSP in schools, including instructional leadership, teacher leadership, distributive leadership, and middle leadership. The stated competency models and standards will serve as a foundation and guidance for the development and design of the HoScP competency model. The advent of education centred on the concept of educating pupils in four disciplines; Science, Technology, Engineering, and Mathematics (STEM) by integrating and applying it in a real-world setting has necessitated an update to the function of HoScP. STEM education is designed to engage students by providing them with challenging, enjoyable, and meaningful activities [11–14]. Science and technology-based education has been prioritised in the Malaysian Education Blueprint (MEB) 2013-2025 as an important agenda in transforming education to prepare the younger generation to face the challenges of the twenty-first century, as well as to prepare students in schools for the demanding career market in science and technology.

The establishment of such a process will allow the HoScP and other relevant parties, as well as Science teachers, to collaborate on improving science teaching and learning to attain the aim of scientific literacy for all pupils. Furthermore, he said that for pupils to fulfil the goals and standards of science education established by the government and schools, professional development and reform in science teachers is critical. According to Klentschy [15], the required system reform approaches should be able to handle the changes of the individuals involved in the system since the individuals involved will impact the structures, processes, and rules that drive the teaching and learning that occurs. He emphasised the importance of developing efficient and successful teacher leaders across school systems and levels in the process of change in science education. This remark, as expressed by Klentschy, demonstrates the relevance of teacher leadership techniques in the process of transformation in science education. When the Ministry of Education (MoE), State Education Department (SED), and District Education Department (DED) plan and implement programmes to change science education, the development of science teachers' leadership should not be overlooked or underestimated. As a result, the MoE, SED, DED and Training Centre who offer HoSP development training should consider HoScP professional development seriously since HoScP require a specific competency model to accomplish their jobs efficiently and effectively. This clearly indicates that HoScP need a specific competency model to assist them

in preparing for the Science education reforms that have been implemented. MoE's objective to foster and create Science literacy in pupils would be accomplished only if the HoScP and Science teachers lead in an efficient and effective manner.

Previous research discovered that teachers, school leaders, and HoSP had distinct norms of behaviour and in the practise of HoSP monitoring. In general, HoSP either follow their own expectations or modify them to better satisfy school leaders expectation. HoSP leadership is dependent on several key contexts and is influenced by several factors such as the experience and personal qualities, teacher characteristics, committee relationships and shared vision, leadership approach, subject-related issues, school administration, school context and school community, and time constraints [16], [17]. In this context, HoSP leadership is dynamic and formed by the social situation, but HoSP self-awareness serves as a balancer or moderator to those influences. Furthermore, Peacock [18] discovered that the major contextual factors impacting the role of HoSP include school leadership structure, school reform, and academic subjects led by the HoSP. He discovered that the school leadership structure was the most influential factor in HoSP leadership practises. He contends that school leadership structures frequently contribute to HoSP role uncertainty.

Malaysian Ministry of Education (MoE) [14] has outlined five main elements for HoSP duties and roles, namely as a liaison between committee members and school leader, performing teaching and learning responsibilities, as a leader and curriculum supervisor, responsible for committee members' development, and responsible for preparing materials for teaching and learning. Figure 1 show in detail the role of HoSP for each of the elements listed.

As a liaison between committee members and school leader

Performing teaching and learning responsibilities
- Teaching by option
- Be an example teacher

As a leader and curriculum supervisor
- Plan, implement, supervise and evaluate teaching and learning
- Manage and mobilize the committee
- Comply with and implement the Curriculum and Assessment Standard Document (DSKP)
- Be an agent of change / innovation
- Plan, prepare and ensure the use of materials
- Manage schedules
- Monitor special rooms
- Perform monitoring
- Plan and implement assessments
- Perform examination analysis
- Make follow-up, rehabilitation and enrichment

Responsible for committee members' development
- Make a needs analysis
- Plan and implement internal programs
- Evaluate the program
- Ensure teacher participation in seminars, workshops and courses

Responsible for preparing materials for teaching and learning
- Provide teaching aids and learning aids
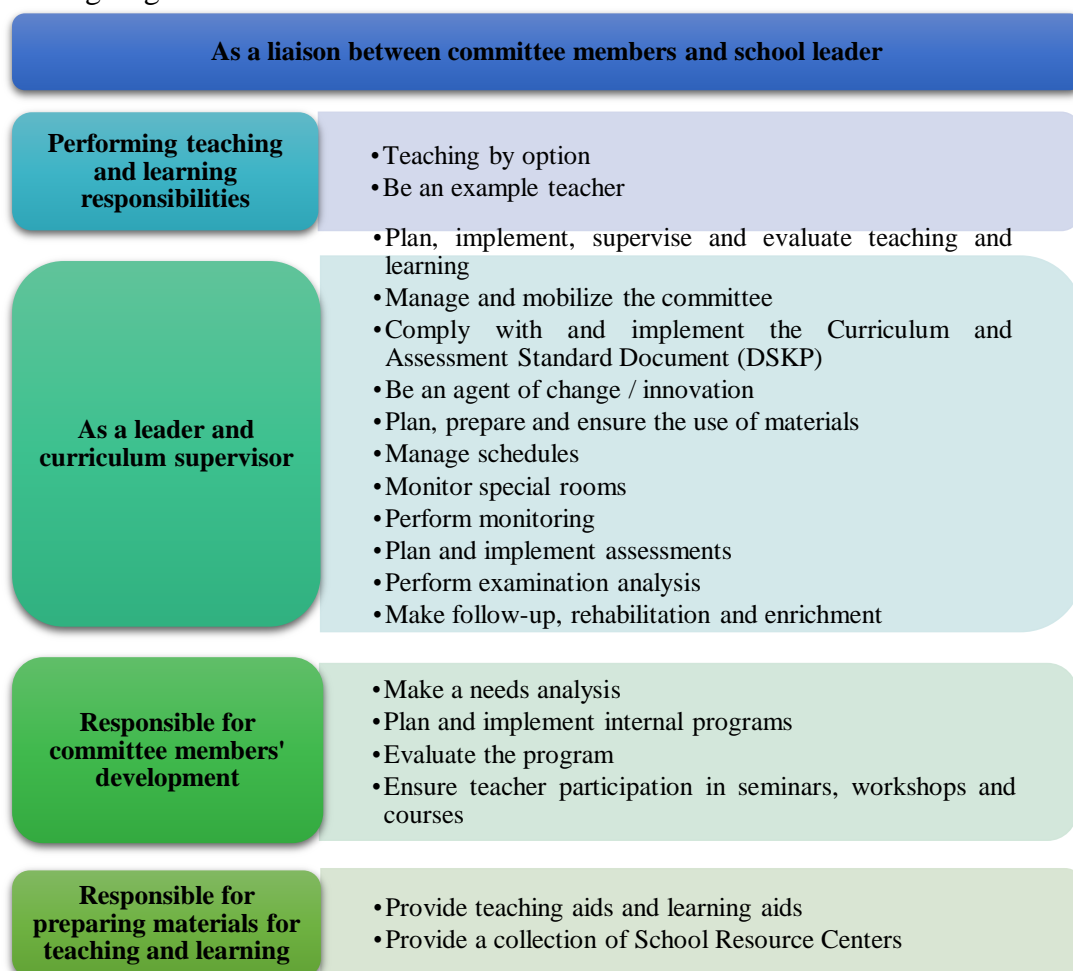- Provide a collection of School Resource Centers

Figure 1: The Roles of Head of Subject Panel (HoSP) [14]

The position of HoSP in the school organizational structure of curriculum committee members is as shown in Figure 2.
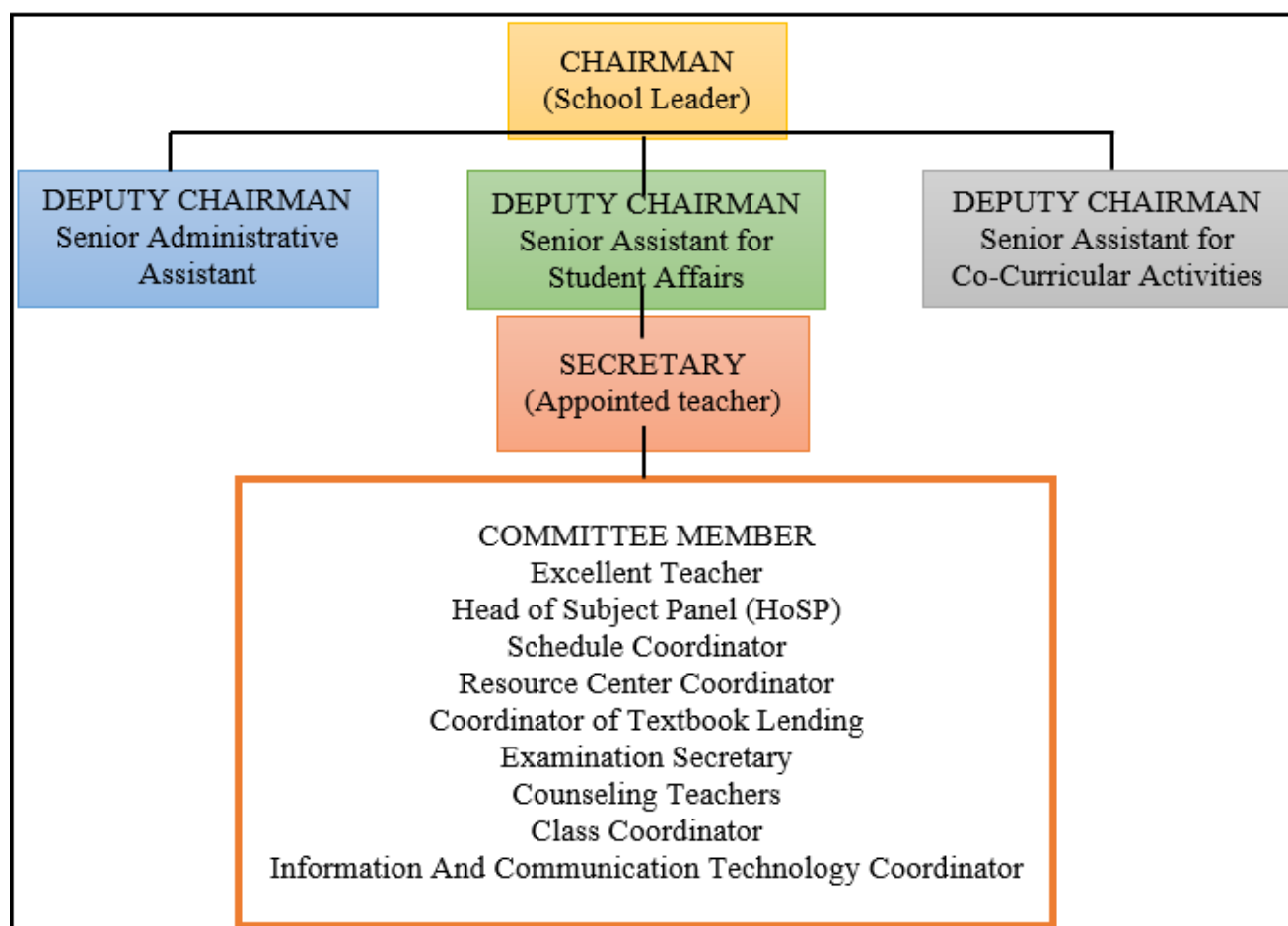

Figure 2: Organizational structure of the School Curriculum Committee [14]

A curriculum committee should be formed in each school to oversee all curriculum policies. According to MoE [14], curriculum committee members play a crucial role in ensuring successful curriculum implementation at the school level. HoSP position as a member of the school curriculum committee must be taken seriously, and the leadership of this group must be developed to ensure that they can develop the curriculum and leading other teachers in properly teaching curriculum content [19, 20]. According to Trobana et al. [19], the role of accountability of a HoScP in establishing the curriculum and learning the knowledge of science pedagogic contents is critical in efficiently presenting curriculum content. This HoScP pedagogical content's knowledge and abilities can be strengthened through ongoing training and professional development.

Fatin Aliah Phang et al. (2014) discovered that there are very few studies in Science and Mathematics education related to school management and leadership by reviewing the highlights of the study from 2001 to 2010. There are just seven theses on leadership and only two on science leadership, Ahmad Sabri (2002) and Mazlan (2005). The findings of this researcher's second study revealed that HoSP monitoring of teaching and learning sessions of Science and Mathematics teachers helps ensure the quality of teaching and learning of teachers. However, they discovered that HoSP's monitoring of Science and Mathematics teachers was insufficient. According to the findings of the above study, there are four types of leadership approaches that might relate to HoSP: instructional leadership, intermediate leadership,

collaborative leadership, and distributive leadership. Furthermore, there are too few studies that investigate HoScP leadership practises in Malaysia.

Methodology:

In this study, the procedure of determining sample selection is based on the recommendation of Keppel and Wickens (2003), who indicated that the study sample is a subset of persons chosen through sampling and can be representative of the population under study. The total sample size for this study is 400 respondents, who are science teachers from primary school and secondary school in five Malaysian zones. Only 400 of the 441 respondents who participated to the disseminated questionnaire were chosen for study after data review and cleaning. To answer the research questions, a descriptive analysis was performed on 400 retained questionnaires to describe some of the sample's characteristics. Table 1 shows how the demographic characteristics of the respondents were classified into six categories.

Table 1: Respondent demographics data

Demographic Profile	Number of respondent (N=400)	Percent (%)
School Type		
Primary school	225	56.3
Secondary school	175	43.7
Gender		
Male	92	23.0
Female	308	77.0
School Location		
North Zone (Perlis, Kedah, Pulau Pinang, Perak)	81	20.3
Middle Zone (Selangor, Wilayah Persekutuan Kuala Lumpur & Putrajaya)	76	19.0
South Zone (Negeri Sembilan, Melaka, Johor)	81	20.3
East Zone (Pahang, Terengganu, Kelantan)	60	15.0
Borneo Zone (Sarawak, Sabah, Wilayah Persekutuan Labuan)	102	25.4
Duration of service		
< 1 year	7	1.8
1 until 5 years	27	6.7
6 until 10 years	57	14.2
> 10 years	309	77.3
Experiences in teaching science subject (year)		
1 until10	126	31.5
11 until 20	198	49.5
21 until 30	76	19.0
Options		
Science	329	82.3
Non science	71	17.7

According to Table 1, respondents' demographic profile is divided into six groups based on Part A of the disseminated questionnaire instrument: school type, gender, school location, duration of service, experience teaching science subjects, and alternatives. There were 225

respondents or science teachers from primary school participated (56.3 %), and 175 science teachers from secondary school (43.7 %). Most science teachers involved are female (308 (77.0 %) with 92 males (23.0 %). While the participation of science teachers from the Borneo Zone was the highest at 102 (25.4 percent), it was followed by the North Zone and the South Zone at 81 (20.3 percent) and 81 (20.3 %), respectively. Following that, the Middle Zone has 76 (19.0 %) and the Eastern Zone has 60. (15 %). 309 (77.3 %) of the science teachers participating have served for more than ten years, with 57 serving for six to ten years (14.2 %). The remaining 27 (6.7 %) for a term of service ranging from one to five years, as well as the involvement of science teachers who served for less than one year, total a minimum of seven (1.8 %).

The 11-20 years group had the most respondents in the category of teaching experience science subjects, including 198 (49.5 %). The category of experience period for 1-10 years is followed by 126 (31.5 %) and the rest is 76 (19.0 %) for the category of 21-30 years. In total, 329 (82.3%) most research respondents are science option and only 71 (17.7 %) non-science option teachers participating. Following that, the results were descriptively evaluated to identify issues in the practise of HoScP leadership competencies from the perspective of science teachers.

Results and Discussion
According to the findings of this study, there are deficiencies in the level of leadership competences possessed by HoScP when viewed from the perspective of science teachers. There are a total of 22 items that have been used to measure HoScP leadership competency practises. These items are categorised into five main constructs, which are as follows: leading through the application of curriculum management; being an example based on leadership skills practised; engaging in organisational development; fostering collaborative values to support peer development and pupil learning; and acting as reflective reference experts through a willingness to self-perform duties.

There are five items that make up the leading through the application of curriculum management. The construct, which is an example based on leadership skills that have been practised, is composed of four different items. There are three different components that make up the construct of engaging in organisational development, and there are five different items that make up the construct of fostering collaborative values to support peer development and pupil learning. The next construct, which consists of acting as reflective reference experts and being willing to self-perform duties, also includes five different items in its list of requirements. The outcomes of the study are presented in the following Table 2, which is organised according to the five primary components that have been outlined based on the perspective of science teachers in Malaysia.

Table 2: Finding of the study

Main Construct	Item	Frequency / Percent (%)				Mean Score	SD	Interpretation of Competency Levels
		VL	L	H	VH			
Leading through the application of curriculum management	. Show a variety of leadership values.	15/ 3.8	103/ 25.7	176/ 44.0	106/ 26.5	2.933	0.818	Low
	2. Having a full dedication to satisfying students' needs.	11/ 2.8	77/ 19.2	174/ 43.5	138/ 34.5	3.098	0.799	High

	3. Fostering a collaborative culture to improve student achievement.	12/3.0	72/18.0	159/39.8	157/39.2	3.153	0.819	High
	4. Establish rules for student behavior and regulation in the classroom.	13/3.3	107/26.7	185/46.3	95/23.7	2.905	0.792	Low
	5. Practicing lifelong learning.	16/4.0	91/22.8	155/38.7	138/34.5	3.038	0.856	High
Being an example based on leadership skills practised	6.Integrity ethics are used in leadership roles.	20/5.0	65/16.3	184/46.0	131/32.7	3.065	0.829	High
	7.Encourage colleagues and pupils to make wise decisions by cultivating this trait.	17/4.3	18/19.5	173/43.2	132/33.0	3.050	0.833	High
	8.Developing pupils' potential for higher order thinking skills	14/3.5	94/23.5	176/44.0	116/29.0	2.985	0.816	Low
	9.Implement decision-making processes among colleagues and pupils.	23/5.8	85/21.2	195/48.8	97/24.2	2.915	0.824	Low
Engaging in organisational development	10.Utilize the importance of lifelong learning.	20/5.0	89/22.3	182/45.5	109/27.2	2.950	2.968	Low
	11.Using data to make decisions.	18/4.5	90/22.5	179/44.8	113/28.2	2.968	0.829	Low
	12.Improve school performance by providing management with feedback.	13/3.3	83/20.7	167/41.8	137/34.2	3.070	0.823	High
Fostering collaborative values to support peer development and pupil learning	13.Cultivate the spirit of teamwork to achieve targeted goals.	18/4.5	76/19.0	165/41.3	141/35.3	3.073	0.848	High
	14.Access and use research data to improve management practices.	22/5.5	111/27.8	182/45.5	85/21.2	2.825	0.825	Low

	15.Making management practise improvements based on data analysis.	19/4.8	107/26.7	188/47.0	86/21.5	2.853	0.808	Low
	16.Collaborate and share responsibility with other teachers for student excellence.	15/3.8	68/17.0	161/40.2	156/39.0	3.145	0.831	High
	17. Implementing professional development through research.	20/5.0	123/30.8	169/42.2	88/22.0	2.813	0.833	Low
Acting as reflective reference experts through a willingness to self-perform duties	18.Practicing ethical standards to follow.	21/5.3	93/23.2	182/45.5	104/26.0	2.923	0.836	Low
	19.Contribute beyond the given task.	24/6.0	114/28.5	162/40.5	100/25.0	2.845	0.868	Low
	20.Mentoring action studies and leading teams.	39/9.8	201/50.2	124/31.0	36/9.0	2.393	0.784	Low
	21.Dealing with instructional issues.	21/6.0	121/30.3	169/42.2	86/21.5	2.793	0.846	Low
	22.Demonstrate exemplary organisational transformation and innovation practices.	25/6.3	108/27.0	182/45.5	85/21.2	2.818	0.837	Low

Indication: VL=Very Low, L=Low, H=High, VH=Very High, SD= Standard Deviation

According to Table 2, eight of the 22 items or practises of leadership competency that have been measured are at a high level, with a mean score ≥ 3.00, a percentage ≥ 75.0, and a standard deviation ≤ 1.00. The items are having a full dedication to satisfying students' needs, fostering a collaborative culture to improve student achievement, practising lifelong learning, integrity ethics are used in leadership roles, encourage colleagues and pupils to make wise decisions by cultivating this trait, improve school performance by providing management with feedback, cultivate the spirit of teamwork to achieve targeted goals, and collaborate and share responsibility with other teachers for student excellence.

Nonetheless, fourteen components remain at a low level, with a mean score ≤ 3.00, a percentage ≤ 75.0, and a standard deviation ≤ 1.00. The items are show a variety of leadership values, establish rules for student behavior and regulation in the classroom, developing pupils' potential for higher order thinking skills, implement decision-making processes among colleagues and pupils, utilize the importance of lifelong learning, using data to make decisions, access and use research data to improve management practices, making management practise improvements based on data analysis, implementing professional development through

research, practicing ethical standards to follow, contribute beyond the given task, mentoring action studies and leading teams, dealing with instructional issues, and demonstrate exemplary organisational transformation and innovation practices.

However, because each of the construct's five components is willing to execute tasks at a low level, they all function as reflective experts. The idea of encouraging collaboration to help the growth of peers and students who recorded three out of five items that were still at a low level was then introduced. Two out of the three items for the construct of participating in organisational development were still at a low level. Each of the two elements is at a high and low level, even if the construct serves as an example based on the leadership qualities that are used. Out of the five items measured, only the leading construct using curriculum management recorded three items at a high level and two more item values at a low level.

In contrast, each of the five items that make up the fifth construct—namely, acting as reflective reference experts through a willingness to self-perform duties —is at a rather low level. After that, the construct of fostering collaborative values to support peer development and pupil learning who had recorded three out of five items that were still at a low level. However, the construct of engaging in organisational development were two of the three items still at low level. Even though the construct of being an example based on leadership skills practised, each of the two items is present at both a high and a low level. Only one of the five constructs that were measured, which are construct leading through the application of curriculum management, recorded three items at a high level, while two additional item values were recorded at a low level.

Conclusion:

In conclusion, the outcomes of the descriptive analysis conducted reveal that there are issues with the HoScPs leadership competencies in Malaysia. In summation, the issue comprises the setting of leadership practise, which is classified as an acting as reflective reference experts through a willingness to self-perform duties at an inadequate level. Problems in the categories of fostering collaborative values to support peer development and pupil learning, as well as engaging in organisational development, are also less than ideal. While the issue in being an example based on leadership skills practised category are on a modest level. The category of problems in the context of satisfactory leadership practises is then leading through the application of curriculum management. This finding is based on the perspectives of Malaysian science teachers. Although there are eight competency items at a satisfactory level for the four categories of leadership practise mentioned above, there are fourteen competency items in HoScP leadership practise that are less than satisfactory and raise concern. It is possible to draw the conclusion from this conversation that, from the point of view of the teachers who teach in the Science Department, there are in fact issues about the level of leadership ability possessed by the HoScPs. Therefore, in order to produce effective teacher leaders in the field of science, the relevant parties and systems need to develop mechanisms that enable the teacher leaders to improve their ability to lead and that can assist teachers in coping with the changes that occur in the teaching and learning that take place.

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