PREDICTORS OF SECONDARY SCHOOL SCIENCE TEACHERS' PERFORMANCE IN NORTHERN MINDANAO, PHILIPPINES

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ABSTRACT: *The study aimed to determine the predictors of secondary school science teachers' performance. It utilized survey questionnaires in gathering data among six hundred thirty-six (636) secondary school science teachers in Northern Mindanao, Philippines. A correlational research design was employed in determining the relationship among the variables in the study. In addition, descriptive statistics, Pearson product-moment correlation, and multiple regression were utilized in analyzing quantitative data. The study's findings revealed that the science teachers moderately practiced professional learning community in the following dimensions: shared values and vision, supportive conditions-relationship, collective learning application, shared personal practices, shared and supportive leadership, and supportive condition-structures. Moreover, the science teachers are highly involved in classroom level-technical domain; moderately involved in school level-technical domain, class level-managerial domain, and school level-managerial domain. On the other hand, all constructs under learning organizations are frequently practiced among science teachers. Likewise, teachers' performance was found to be very satisfactory in terms of the curriculum and instructions, leadership and governance, accountability and continuous improvement, and management of resources. The study further revealed a highly significant correlation between professional learning community practices, decision making, and learning organization towards teachers' performance. Lastly, the variables shared vision, personal mastery, system thinking, school level-managerial domain, and supportive condition-structure are the predictors of teacher's performance. Based on the study's findings, professional learning community practices, involvement in decision making, and learning organization greatly influenced the secondary school science teacher's performance in the region. Thus, school administrators may consider the variables mentioned above since they are significant predictors of teachers' performance.*

Keywords: *decision making, learning organization, professional learning community, teacher's performance*

1. INTRODUCTION

Teachers are known to be the prime movers in the delivery of quality education. Hence, the role in molding the learners' future is a teacher's exceptional task. The teachers are the most important element of the educational system wherein professional advancement can be a contributory factor in the delivery of quality education in the teaching and learning process [1]. How a teacher acts in terms of professional learning depends on a number of factors such as his or her internal traits and the school's structural conditions for professional learning. The former includes motivation to engage in professional learning and the latter pertains to the degree of the teachers' involvement in decision-making about what and how they learn.

In the Philippines, public school teachers are not only focused on classroom teaching but also tasked to do a multitude of responsibilities as mandated by the Department of Education (DepEd). With this, providing quality instruction to learners has been affected. With the increasing orders of the agency such as zero drop-out rates, inclusive education, heavy workloads attributed by the K to 12 curriculum, additional forms and surmountable paper works, teacher's performance is compromised. In addition, the National Achievement Test score in science in school year 2014-2015 in Region-X obtained a mean score of 50.22 which is lower than the 75% national passing score set by the Department of Education. The low national assessment result is alarming among science teachers and administrators in the Department of Education because it may be attributed to the teachers' performance.

DepEd Order No. 35, s. 2016 recognizes that the quality of learning is greatly influenced by the quality of teaching. Thus, there is a need for the Department of Education to appoint quality teachers and support educators' professional development in the teaching fields. Organizing professional learning communities will support teachers in building new knowledge about instruction as well as in changing traditional beliefs and assumptions on education, community, teaching and learning [2]. The professional learning community plays an important role in promoting and sustaining learning of all professionals in the school community to improve student learning [3].

The day-to-day experience in schools such as dialogues with colleagues, exposure to school culture, and other professional engagement might contribute to the development of potentials and capacities required by teachers as they play a vital role as agents of change. A number of studies had been conducted to determine factors associated with students' performance [4, 5, 6], teacher skills, and knowledge [7, 8, 9, 10, 11], science teachers' awareness, and perceptions on contemporary issues [12, 13, 14] and pedagogies in teaching science [15, 16, 17, 18], while little is done to determine predictors of teachers' performance. Recent studies identified teachers' participation in decision-making as an important consideration in efforts to restructure and reform public schools [19]. Likewise, earlier studies suggested that teachers, acting as leaders, had a greater commitment to change [20]. The implication was that teachers who participated more in school decision-making tend to provide effective leadership, manifest strong

commitment, and improved performance. Shared decision-making was deemed as a catalyst for teachers to lead beyond the classroom sphere. Thus, sharing or participating in this context has shifted from simply co-opting teachers to focus more on empowering to lead.

The learning organization as a concept was developed with a vision of enhancing general organizational performance. It is affirmed that every experience gained in the learning organization will contribute to the learning process and this will further contribute to the motivation of the members and encourage them to work in teams [21].

Increased focus on student achievement has caused educational reformers to challenge schools, their staff, and leaders, to think differently about their fundamental philosophies regarding teaching and learning [25,]. Through the augmented focus on school reorganization, several assumptions were made on how to improve teaching effectiveness in relation to teacher collaboration, combating teacher-isolation, relationships between teacher isolation and morale as well as student performance.

With the aforementioned challenges attributed to teachers' performance, it is imperative that educators may consider the professional learning communities, decision- making and learning organization among public school teachers as options in enhancing teachers' performance. Thus, this study was conducted.

2.   MATERIALS AND METHODS
This research utilized descriptive-correlational design. By means of employing this combined approach, the researcher obtained the advantages of both establishing relationships between the variables and determining the effects of the independent exogenous variables toward the dependent endogenous variable.

Furthermore, this research sought to determine the predictors that best describes the performance of teachers relative to the professional learning community practices, learning organization and decision making.

To facilitate the collection of data from the participants, the study utilized the following modified questionnaires namely: Professional Learning Community Questionnaire [26], Decision Making Questionnaire [27] and Learning Organization Model Questionnaire [28]. On the other hand, the School-Based Management Questionnaires [29] was used in determining teachers' performance.

The participants of this study were the public secondary school science teachers from the different divisions in Region 10- Northern Mindanao, Philippines. Total enumeration was employed in determining the six hundred thirty-six (636) secondary school science teachers as participants from the different divisions in Region X

A letter of request was addressed to the Regional Director of Department of Education of Region X prior to the conduct of the study. Letter of permission was secured from the Schools Division Superintendents and to the School Principals allowing the researcher to conduct the study among the secondary school science teachers in their respective schools. Quantitative data were collected through survey questionnaires which were administered among the participants.

Pearson's product-moment correlation (Pearson r) was used to establish the relationship between teacher's professional learning community practices, extent of involvement in decision making, and learning organization on teacher's performance. Moreover, multiple linear regression was employed to determine the variables that best predict teachers' performance.

3.   RESULTS AND DISCUSSIONS
This section presents the interpretation and analysis of data on the professional learning community practices, extent of involvement in decision making, learning organizations and performance of secondary school science teachers in Region X.

3.1   Science Teachers' Professional Learning Community Practices
The summary of science teachers' professional learning community practices is revealed in Table 1. The grand mean score of 3.23 indicating "moderately practiced" was obtained in all six (6) dimensions. Shared Values and Vision, Supportive Conditions- Relationship, Collective Learning and Applications, Shared Personal Practice and Shared and Supportive Leadership and, Supportive Conditions- Structure with mean scores of 3.28, 3.27, 3.25, 3.20, and 3.16, respectively. The results suggest that the science teachers show favorable and almost have the same professional learning community practices.

Professional learning community practices involve shared governance amongst its members that will ultimately result in a positive contribution to the change process in school improvement [30].

Table 1. Summary of the professional learning community practices
of science teachers

PROFESSIONAL COMMUNITY PRACTICES	MEAN	DESCRIPTIVE RATING	QUALITATIVE INTERPRETATION
Shared Values and Vision	3.28	Agree	Moderately Practiced
Supportive Conditions- Relationship	3.27	Agree	Moderately Practiced
Collective Learning and Applications	3.25	Agree	Moderately Practiced
Shared Personal Practice	3.20	Agree	Moderately Practiced
Shared and Supportive Leadership	3.20	Agree	Moderately Practiced
Supportive Conditions- Structure	3.16	Agree	Moderately Practiced
Grand Mean	3.23	Agree	Moderately Practiced

3.2   Science Teachers' Extent of Participation in Decision Making
Table 2 elucidates the summary of the science teachers' participation in decision making. The summary illustrates that the science teachers were moderately involved in decision-making process with a grand mean score of 3.40. With these, class level-technical domain obtained the highest mean score of 3.66 indicating that they are "highly involved" in decision-making process. However, science teachers were moderately involved in areas of school level-technical domain, class

level-managerial domain, and school level-managerial domain with mean scores of 3.47, 3.44, and 3.04, respectively.

Table 2. Summary of the extent of teacher's participation in decision making

DECISION MAKING	MEAN	DESCRIPTIVE RATING	QUALITATIVE INTERPRETATION
Class Level- Technical Domain	3.66	High	Highly Involved
School Level-Technical Domain	3.47	Sometimes	Moderately Involved
Class Level-Managerial Domain	3.44	Sometimes	Moderately Involved
School Level-Managerial Domain	3.04	Sometimes	Moderately Involved
Grand Mean	3.40	Sometimes	Moderately Involved

The findings of the study revealed that science teachers have shown different level of participation in decision-making in school. This claim was supported by the study which found out that in school teachers have different levels of involvement in different decision-making domains [31]. They showed moderately involved in curriculum and instruction, co-curriculum, and their welfare decisions. Their findings also revealed that most of the teachers are involved in the implementation stage only.

3.3　Science Teachers' Learning Organization

The summary of the learning organization of science teachers is revealed in Table 3.

Table 3. Summary of the science teacher's learning organization

LEARNING ORGANIZATION	MEAN	DESCRIPTIVE RATING	QUALITATIVE INTERPRETATION
System Thinking	4.24	Usually True	Frequently Practiced
Team Learning	4.16	Usually True	Frequently Practiced
Personal Mastery	4.14	Usually True	Frequently Practiced
Shared Vision	4.12	Usually True	Frequently Practiced
Mental Models	4.11	Usually True	Frequently Practiced
Grand Mean	4.15	Usually True	Frequently Practiced

As reflected in the table, the overall results showed a grand mean of 4.15 indicating that teachers "frequently practiced" the five (5) dimensions namely: System Thinking (4.24), Team Learning (4.16), Personal Mastery (4.14), Shared Vision (4.12), and Mental Models (4.11).

The results show that science teachers' have almost the same levels of learning organization in different dimensions. This means that secondary school science teachers' have more or less the same practices in their schools. It was suggested that organizational learning improves an institution's competitive edge and responsiveness to change, piquing interest in creating organizations that support and foster learning [32].

3.4　Performance of Science Teachers

As reflected in Table 4 on the summary of the science teachers' performance, the overall results showed a grand mean of 4.09 indicating very satisfactory performance that "exceeds expectation" rating.

The present study shows that the mean score of 4.13 under the curriculum and instruction obtained the highest mean score followed by leadership and governance (4.11), then accountability and continuous improvement (4.07), and management of resources (4.06). The outcome implies that the secondary school science teachers really performed in

meeting the needs of the learners and the school community. They also manifested shared leadership in planning out the curriculum, learners' continuous improvement and in managing school resources. As it is reiterated that teachers' performance predicted school effectiveness [33], hence, the above findings are confirmed.

Table 4. Summary of performance among secondary school science teachers

Teachers' Performance	MEAN	DESCRITPIVE RATING	QUALITATIVE INTERPRETATION
Curriculum and Instruction	4.13	Very Satisfactory	Exceeds Expectation
Leadership and Governance	4.11	Very Satisfactory	Exceeds Expectation
Accountability and Continuous Improvement	4.07	Very Satisfactory	Exceeds Expectation
Management of Resources	4.06	Very Satisfactory	Exceeds Expectation
Grand Mean	4.09	Very satisfactory	Exceeds Expectation

3.5 Relationship Among the Variables Being Tested

As projected in Table 5, highly significant relationship existed between teachers' professional learning community practices (r=0.379, p=0.000**), decision making (r=0.381, p=0.000**), and learning organization (r=0.588, p=0.000**) towards teacher's performance.

With these findings, the null hypothesis which states that "Participants' professional learning community practices, extent of involvement in decision making, and learning organization have no relationship with teaching performance" is rejected.

This means that a significant increase of teachers' professional learning community practices, decision making, and learning organization will also increase significantly the teachers' performance. Therefore, there is a need for the Department of Education to consider the different variables in improving teachers' performance which is imperative for the success of the school.

Table 5. Correlation between professional learning community practices, extent of decision making, and learning organization on science teachers' performance

Variables	Correlation Coefficient	p-value
Professional Learning Community Practices	.379	.000**
Shared and Supportive Leadership	.345	.000**
Shared Values and Vision	.332	.000**
Collective Learning and Application	.345	.000**
Shared Personal Practices	.326	.000**
Supportive Condition-Relationship	.297	.000**
Supportive Conditions-Structures	.361	.000**
Decision Making	.381	.000**
Class Level-Technical Domain	.345	.000**
Class Level-Managerial Domain	.346	.000**
School Level-Technical Domain	.329	.000**
School Level-Managerial Domain	.327	.000**
Learning Organization	.588	.000**
Personal Mastery	.519	.000**
Mental Models	.508	.000**
Shared Vision	.560	.000**
Team Learning	.498	.000**
System Thinking	.502	.000**

** Correlational is significant at the 0.01 level (2-tailed)

The results of the study were supported by the study, in which they showed that teachers performed better when they are actively involved in the school decision-making process [34]. Lastly, a strong and direct relationship existed between the learning organization and employees' performance [35].

3.6   Predictors of Science Teachers' Performance

Table 6 reveals the regression model of the study. Three (3) independent variables best predict science teachers' performance namely: Professional Learning Community Practices, Decision Making, and Learning Organization. For the professional learning community practices, support condition-structure is the best predictor variable on science teachers' performance with the beta weight value of $\beta=0.108$ and p-value of 0.002.

Table 6. Regression analysis showing the extent of influence of predictor variables on teachers' performance

Indicators	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
Constant	1.722	.130		13.210	.000
Learning Organization					
Shared Vision	.150	.043	.198	3.524	.000
Personal Mastery	.162	.034	.212	4.814	.000
System Thinking	.128	.039	.161	3.275	.001
Decision Making					
School Level- Managerial Domain	.065	.015	.151	4.457	.000
Professional Learning Community Practices					
Supportive Condition- Structure	.108	.035	.108	3.085	.002
	R=.624	R²=.390	F= 80.434	R= .624	Sig. 000

Moreover, science teachers' decision-making with the subcategory school level-managerial domain shows the best influence on teachers' performance with a beta weight value of β 0.151 with a p-value of 0.000. Lastly, science teachers' performance was affected by its learning organization shared vision with a beta weight value of $\beta= 0.198$ with a p-value of 0.000, personal mastery with a beta weight value $\beta=0.212$ with a p-value of 0.000, and system thinking with beta weight value of $\beta=0.161$ with a p-value of 0.001.

The R^2 value was 0.390 suggests a 39% of the secondary school science teachers' performance was attributed by the following variables shared vision, personal mastery; system thinking, school level-managerial domain, and supportive condition-structure while 61% can be credited to another factor not involved in the regression model. Thus, the null hypothesis stating that "there is no independent variable that best predicts the performance of secondary school science teachers", is rejected.

Furthermore, the F-ratio suggested that the overall regression model is a good fit for the data. The table displays that the independent variables significantly predict the dependent variable as illustrated: F=80.434 with p-value of 0.000, thus, the model is exemplified.

$$Y= 1.722+0.150X_1+0.162X_2+0.128X_3+0.065X_4+0108X_5$$

Where: 1.722 is constant
$Y=$ science teachers' performance
$X_1=$ shared vision
$X_2=$ personal mastery
$X_3=$ system thinking
$X_4=$ school level-managerial domain
$X_5=$ supportive condition-structure

Outcomes of the study conformed to the findings that shared vision, team learning, and personal mastery were predictors of teachers' organizational commitment [36]. A researcher gives emphasis on the participation of teachers in decision-making concerning issues on deprivation in participating in managerial level [37]. Results of their investigation revealed that teachers' participation in decision-making concerning teacher issues is the strongest predictor of job satisfaction. The findings of the study contradicted the study the findings in which collective learning and applications is the only predictor of teacher professionalism [38]. However, for professional learning communities to work effectively, it should be implanted in the school-based management in the school and should be part of the everyday task of teachers and other professionals working in the academic community [39].

4.   CONCLUSIONS AND RECOMMENDATIONS

Based on the findings of the study, the following conclusions were drawn:

The professional learning community practices is more or less the same among the secondary school science teachers. They are found to have different levels of involvement in different decision-making domains. Likewise, science teachers had already established a learning organization but they need to be improved and supervised in order to sustain effectively.

The secondary school science teachers' performance is generally very satisfactory is in terms of leadership and governance, curriculum and instruction, accountability and continuous improvement, and management of resources. However, they need to strengthen their effort in the management of resources and accountability and continuous improvement for these are found to be with the lowest mean.

Professional learning community practices, the extent of involvement in decision making, and learning organization are important factors for secondary school science teachers' performance.

The aspects of learning organization in terms of shared vision, personal mastery, system thinking; decision making in terms of school-level- managerial domain; and professional learning community practices in terms of supportive condition-structure are among the variables that best predict teachers' teaching performance.

Based on the aforementioned conclusions, educators and school administrators may consider the importance of professional learning community practices, decision making, and learning organization in improving teachers' performance. A similar study may be conducted utilizing qualitative research or mixed methods research design to further uncover variables that may affect teachers' performance.

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