SYSTEM THINKING-BASED APPROACH AND CONFLICT MANAGEMENT OF PUBLIC ELEMENTARY SCHOOL HEADS

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Abstract. The study aimed to determine the extent of system thinking-based approach and the extent of conflict management of public elementary school heads. This study employed a non-experimental quantitative research design utilizing descriptive-correlation method. Validated questionnaire and Universal sampling procedure were utilized considering the minimal number of teachers in the research locale. Two hundred fifty (250) public elementary school teachers were the respondents of the study. Using mean, pearson-r, and regression analysis, the findings revealed that the system thinking-based approach was extensive while the conflict management of public elementary school heads was also very extensive. Moreover, the overall results disclosed that indicators for the system thinking-based approach were positively related to the conflict management of public elementary school heads. Further, results from the regression analysis revealed the following have a strong influence of system thinking-based approach on the conflict management of public elementary school heads: cooperation to advance school improvement, preference, and skillset. It is recommended that the school heads should foster open communication to create channels for open and transparent communication amongst all stakeholders. Regularly communicate the school's goals, values, and progress to build mutual understanding and collaboration. It is also recommended that the school heads should establish a team of trained staff members who can mediate and resolve conflicts when they arise.

1. Introduction

The ability to see issues and possibilities holistically, pinpoint core causes, and create practical solutions to enhance intricate systems and procedures are all benefits of systems thinking for teachers. Additionally, engineering, management, and environmental research have long made use of systems thinking. Understanding and resolving complicated issues in education have received more attention recently. Systems thinking-based approaches are predicated on the idea that dynamic, interrelated complex systems are necessary for the solution of real-world issues. Systems thinking-based approach has been applied in various ways in education, including curriculum design, teacher professional development, and school leadership. Systems thinking-based approach is a mindset and approach that helps educators understand and

address the complex and interconnected nature of education systems. It involves considering the relationships between different parts of the system, such as laws, funding, schools, teachers, materials, and students, and how they impact one another. This approach can be applied in various ways in education, including by teachers in the classroom, school and district leaders in their management and organizational styles, and administrators in restructuring educational systems or schools. Systems thinking-based approach can also give learners a participatory role in the learning process and help them develop critical thinking skills by understanding how different systems interact and relate to one another. Systems thinking can be a practical approach to improving student engagement, organizing schools, and addressing educational challenges. The educational system around the globe, at present, faces complexity due to the mandate of "new normal" facing the challenges while combating against COVID-19. For this reason, globally learners are encouraged to have online learning while the third world country like the Philippines, particularly in the Department of Education (DepEd) system, has faced modular approach to ensure the continuous learning of pupils at home. Meanwhile, to handle complexity, it is vital that the systems thinking approach is utilized to possibly eliminate or, if not, minimize the gap and embrace changes. According to Williams (2014), systems thinking enables school heads to identify mismatches with the environment, weaknesses in the organization and missing systemic elements in the organization. This may lead to redesigning the organization and ensuring its survival and growth. Thus, coping with complexity is at the heart of management and leadership in the turbulent environments faced by the organizations and societies of our day. The system's approach provides transdisciplinary theories and tools for dealing with this challenge more effectively than efforts merely based on disciplinary insights or pragmatic recipes. The Department of Education system, particularly teachers, will be able to handle complexity in the emergence of new and more diversified forms of teaching, learning, and learners' support and the increased autonomy and accountability among teachers involved. In the Philippine context, the study of Galiza, et. al., (2018) found that teachers in schools have received insufficient training from the government and hardly participated in the different professional development activities. The teacher's teaching experience allowed teachers to facilitate classroom management, instructional strategies, and learner engagement. Meanwhile, teachers who were new within the teaching profession continued teaching beyond their first five years within the classroom (Rector, 2013). On the other hand, a systems thinking-based approach is literally a system of thinking about systems. As discussed later in this paper, this highlights the issues with the definitions available within the literature. Besides, Meadows (2018) explained that systems thinking comprises three vital foundations: elements, interconnections, and a function or purpose. Remarkably, he added that the function or purpose that is often the most crucial element of the system's behavior is the least obvious part. Though not all systems have a clear goal or objective, systems thinking does. Hence, a systems-thinking-based approach is widely believed to be critical in handling the complexity facing the world in the coming decades; however, it still resides in the educational margins. Moreover, for educational leaders, the need for change is urgent at a time when Philippine regulations are more flexible, giving schools more freedom to create development projects that are specifically customized to the Department of Education system's particular situation. This possibility raises the question of whether school administrators have the knowledge and experience necessary to restructure their institutions and get past a string of unsuccessful attempts at

school development (Sanna, 2019). Thus, the foregoing statements prompted the researcher to investigate the systems thinking approach towards conflict management among DepEd teachers of Maa District, Division of Davao City This study was conducted on the relationship between systems thinking-based approach and conflict management of public elementary school heads of Maa District, Division Davao City, thus, the urgency of this study is needed.

2. Methodology

This chapter discusses the research methods which give direction in this investigation. It includes the research design, research respondents of the study, research instrument and the data gathering procedures.

2.1. Research Design—This study used a non-experimental quantitative research design utilizing correlational method. According to Catena (2012), descriptive correlational method is used to determine the relationship between two or more variables and to ascertain their relationship. Moreover, Jaspe (2022) emphasizes that this method is used since the study provides a description of individuals and aims to explain the nature of the data. This study is descriptive in nature since it investigated the systems thinking approach and conflict management of public elementary school teachers of Maa District, Division of Davao City. This is correlational since it determines systems thinking-based approach influence the conflict management of public elementary school heads. The said design was used in this study since it described the information collected based on the survey questionnaire as the main tool of the study. It describes what exists and may help to uncover new facts and meanings. Descriptive research design aims to describe a population, situation, or phenomenon accurately and systematically. It can answer what, where, when, and how questions, but not why questions.

2.2. Research Respondents—This study was conducted in seven (7) schools of Maa District, Division of Davao City. The respondents are composed of 250 selected teachers of Maa District, Division of Davao City. They have been in the service for at least five to ten years teaching experience in the Department of Education (DepED) and have said something on the systems thinking-based approach and conflict management of public elementary school heads. Random sampling technique was employed in this study. However, Langub Elementary School and Magtuod Elementary School with 100 percent of respondents were involved. For the rest of the schools, fifty percent were given the questionnaires. The schools are equidistantly located in the whole district, which can be reached by means of land transportation facilities. The environment is conducive to educational research.

2.3. Research Instrument—The survey questionnaire was the main tool of the study. The questionnaire for this study was patterned and modified to fit in with the present study conducted. The Systems Thinking Approach questionnaire was patterned and modified from the study of Sanna entitled: "The Potential of Systems Thinking for K-12 Principals." Meanwhile, the Handling Complexity questionnaire was patterned and modified from the study of Neefe (2018) entitled: "Handling Complexity for Continuous Improvement and Evaluation." The questionnaire was modified mainly through the researcher's preferences to suit the needs of the study. The adapted questionnaire was validated by the experts from the DepEd-Division of Davao City. Validity of the instrument was ensured through expert's opinions and pilot test-

ing. To ensure the reliability of the instrument, a pilot test was conducted through calculating the value of Cronbach's Alpha with the obtained values of 0.912. The questionnaire was divided into two (2) parts, namely: the extent of system thinking-based approach, and the extent of conflict management among public elementary school heads. The Cronbach's value of the construct has met the minimum reliability of 0.912, it means that the measures used are consistent enough for the study. In terms of instrument's face validity, the items were modified to suit the purpose of this study and were validated by experts. The questionnaire was presented to the adviser for comments, corrections, and suggestions. Part 1 of the questionnaire contained the items on the systems thinking-based approach with the following aspects: preference, school management, school head skillset, and alignment to promote school improvements. Part 2 pertained to the conflict management of public elementary school heads with the dimensions, namely: operations, regulatory directions, control, intelligence, and policy. The perceptions of the respondents on systems thinking-based approach and conflict management among school heads of Maa District teachers were based on the following Five-point Likert rating scales:

Range, Descriptive Equivalent, and Interpretation of Systems Thinking-Based Approach and Conflict Management

Range	Descriptive Equivalent	Interpretation
4.20-5.00	Very Extensive	The systems thinking-based approach and conflict management is very much evident.
3.40-4.19	Extensive	The systems thinking-based approach and conflict management is very evident.
2.60-3.39	Moderately Extensive	The systems thinking-based approach and conflict management is fairly evident.
1.80-2.59	Less Extensive	The systems thinking-based approach and conflict management is less evident.
1.00-1.79	Not Extensive	The systems thinking-based approach and conflict management is not evident.

2.4. Data Gathering Procedure—1. Permission to conduct study. The researcher wrote a letter asking permission from the Dean of Graduate School to conduct this research study. The researcher secured a permit to conduct the study from the Office of the Schools Division Superintendent of the Division of Davao City through channels to the Office of the Public Schools District Supervisor (PSDS) of the different schools. 2. Distribution and retrieval of questionnaires. Upon approval of the permit to conduct the study, the sets of questionnaires were sent to the respondents via google forms and through email-add of the school heads and teachers. The questionnaires were retrieved right after the respondents were through answering the questions and sent them back through researcher's email-add or messenger. 3. Collection and statistical treatment of data. The data were collected during the Corona Virus Pandemic (COVID-19) time; therefore, the collection of data was based on the protocols set by the Inter-Agency Task Force (IATF) standards. IATF is a task force organized by the executive of the Philippine government to respond to affairs concerning emerging infectious dis-

eases in the Philippine which was convened in January 2020. The collection of data was conducted following the protocols of IATF to avoid being contaminated and infected by COVID-19. For some participants who missed answering the questionnaire, the video call, via messenger, viber, zoom or goggle meet were used to gather the data or responses of the participants. These were submitted to the statistician for analysis. The researcher together with the statistician tabulated the data, analyzed, and subjected them for statistical analysis.

2.5. Data Analysis—The following statistical tools were used in the analysis and interpretation of the responses in this study: Mean. It was used to determine the extent of systems thinking-based approach and conflict management of public elementary school heads of Maa District, Division of Davao City. Pearson Product Moment Correlation Coefficient (Pearson-r). This statistical tool was used in determining the significant relationship systems thinking-based approach and conflict management of public elementary school heads of Maa District, Division of Davao City. Multiple Linear Regression. This was used to determine the significant influence of systems thinking-based approach and conflict management of public elementary school heads of Maa District, Division of Davao City.

3. Results and Discussion

Presented in this chapter were the results of the data gathered. Two sets of research were employed to determine the extent of system thinking-based approach and conflict management of public elementary school heads of Maa District, Division of Davao City. The discussion of the results and interpretations were presented accordingly based on the statement of the problems. Presentation of the interpretation was arranged according to the sub-headings: The extent of system thinking-based approach in terms of preference, school management, skillset, cooperation to advance school improvement, and transformational; the extent of conflict management of public elementary school heads in terms of operations, regulatory directions, control, intelligence, and policy; and which factors of system thinking-based approach significantly influence the conflict management of public elementary school heads of Maa District, Division of Davao City.

Summary on the Extent of System Thinking-Based Approach. Presented in Table 1 shows the summary on the extent of system thinking-based approach of public elementary school heads. The indicator with highest mean is cooperation to advance school improvement with a mean of (4.20), interpreted as very extensive. It is then followed by school management has a mean of (4.19) identified as extensive. Further, skillset had revealed a mean of (4.17), which again interpreted as extensive. Lastly, preference has the least mean of (4.16) which also described as extensive. With an overall generated mean of (4.19) or extensive, therefore the summary extent of system thinking approach of public elementary school heads was sometimes evident. It means that system thinking-based approach of public elementary are always evident as perceived by the school heads of Maa District, Division of Davao City.

Table 1. Summary on the Extent of System Thinking-Based Approach

No	Statements	Mean	Descriptive Equivalent
1	Preference	4.16	Extensive
2	School Management	4.19	Extensive
3	Skillset	4.17	Extensive
4	Cooperation to Advance School Improvement	4.20	Very Extensive
	Overall Mean	4.18	Extensive

The results support the hypothesis put forth in a study by Thien and Razak (2015), which claimed that schools function as open social systems and are complex organizations characterized by social interactions among stakeholders in a range of levels and roles who collaborate to achieve a common objective in accordance with common standards and values. A systems perspective, according to Lunenburg (2017), "assumes that organizations, or the individuals within them, set aside outdated ways of thinking, freely share ideas with others, have a shared vision, and are committed to improving processes and services or products in ways that ensure the success of the organization.

Summary on the Extent of Conflict Management of Public Elementary School Heads. Presented in Table 2 shows the summary extent of conflict management of public elementary school heads. The indicator with highest mean is control (4.23), interpreted as very extensive. It is then followed by intelligence has a mean of (4.21) identified as very extensive. Further, operations had revealed a mean of (4.20), which again interpreted as very extensive. In addition, regulatory direction has obtained a mean of (4.22) which also identified as very extensive. Lastly, policy has the least mean of (4.16) described as extensive. With an overall generated mean of (4.20) or very extensive, therefore the summary extent of conflict management of public elementary school heads was always evident. It means that conflict management of public elementary are always evident as perceived by the school heads of Maa District, Division of Davao City.

Table 2. Summary on the Extent of Conflict Management of Public Elementary School Heads

No	Statements	Mean	Descriptive Equivalent
1	Operations	4.20	Very Extensive
2	Regulatory Direction	4.19	Extensive
3	Control	4.23	Very Extensive
4	Intelligence	4.21	Very Extensive
5	Policy	4.16	Extensive
	Overall Mean	4.20	Very Extensive

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The finding is congruent to the idea of Bolman and Deal (2015) that change frequently fails when leaders concentrate primarily on the structural parts of change and ignore the human, political, and symbolic dimensions within schools. Others claim that while having a top-notch curriculum, education, and family involvement are important for successful schools, administrators also need to pay attention to culture. On the other hand, the school heads view the operational and regulatory direction indicators of managing conflict differently. Policy, intelligence, and control. Their diverse roles, where they can have different tasks, priorities, and even areas of concern, can be blamed for the outcome. Significant Relationship Between the Systems Thinking-Based Approach and Conflict Management of Public Elementary School Heads of Maa District, Division of Davao City

Shown in Table 3 is the statistical analysis on the significant relationship between the systems thinking-based approach and conflict management of public elementary school heads of Maa District, Division of Davao City. Based on the said analysis, the overall p-value is equal to 0.000 with an r-value equal to 0.614. This means that there is a strong positive significant association between the systems thinking-based approach and conflict management of public elementary school heads of Maa District, Division of Davao City. Hence, this study rejects its established null hypothesis. The analysis further implies that an increasing utilization of systems thinking-based approach by the public elementary school heads of Maa District, Division of Davao City leads to an increase of their conflict management.

Table 3. Significant Relationship Between the Systems Thinking-Based Approach and Conflict Management of Public Elementary School Heads of Maa District, Division of Davao City

Conflict Management	Systems Thinking-Based Approach	r	p-value	Decision on H0
Preference	0.546	0.000	Reject	There is a moderate positive significant correlation
School Management	0.290	0.000	Reject	There is a very weak positive significant correlation
Skill Set	0.447	0.000	Reject	There is a moderate positive significant correlation
Cooperation to Advance School Improvement	0.641	0.000	Reject	There is a strong positive significant correlation
Overall	0.614	0.000	Reject	There is a strong positive significant correlation

Particularly, the analysis in Table 2 highlighted also the association between each factor of the systems thinking-based approach and conflict management of public elementary school heads of Maa District, Division of Davao City. Based on the said analysis, the Cooperation to Advance School Improvement factor of the systems thinking-based approach ranked as the top indicator with a p-value of 0.000 and r-value of 0.641. This result implies that there is a strong positive significant relationship between the cooperation to advance school improvement and conflict management of public elementary school

City. This was followed by the Preference factor of the systems thinking-based approach obtaining a p-value of 0.000 and ¬r-value of 0.546. This means that there is a moderate positive significant relationship between the preference factor of the systems thinking-based approach and conflict management of public elementary school heads of Maa District, Division of Davao City. Next, the Skill Set factor of the systems thinking-based approach obtained a p-value of 0.000 and r- value of 0.447. Still, this implies that there is a moderate positive significant relationship between the skill set factor of the systems thinking-based approach and conflict

management of public elementary school heads of Maa District, Division of Davao City. Lastly, the School Management factor of the systems thinking-based approach obtained a p-value of 0.000 and ¬r-value of 0.290. This means that there is a weak positive significant relationship between the school management factor of the systems thinking-based approach and conflict management of public elementary school heads of Maa District, Division of Davao City.

Regression Analysis on the Significant Influence of the Systems Thinking-Based Approach on the Conflict Management of Public Elementary School Heads of Maa District, Division of Davao City

Shown in Table 4 is the regression analysis on the significant influence of the systems thinking-based approach on the conflict management of public elementary school heads of Maa District, Division of Davao City. The overall regression analysis obtained a p-value < 0.000

and F-value equal to 21.219 which is higher than the set critical value. This means that the systems thinking-based approach has a significant influence on the conflict management of public elementary school heads of Maa District, Division of Davao City. This further implies that the regression model used in the analysis of the study is useful which means that there is validity in the interpretation on the assumption of the said influences. Relatively, the regression analysis as presented in the same table shows that there are three (3) out of the four (4) factors of systems thinking-based approach significantly influenced the conflict management of public elementary school heads of Maa District, Division of Davao City. Therefore, the established null hypothesis of this study that there are no factors of systems thinking-based approach that significantly influence the conflict management of public elementary school heads of Maa District, Division of Davao City is rejected.

Table 4. Regression Analysis on the Significant Influence of the Systems Thinking-Based Approach on the Conflict Management of Public Elementary School Heads of Maa District, Division of Davao City

Conflict Management Systems Thinking-Based Approach	Unstandardized Coefficients β	Standardized Coefficients Std. Error	Beta	t	Sig.	Decision on Ho
Constant	3.140	.200		15.671	.000	
Preference	.159	.039	.259	4.091	.000	Reject
School Management	.024	.035	.039	.698	.486	Accepted
Skill Set	.108	.036	.253	3.032	.000	Reject
Cooperation to Advance School Improvement	.179	.028	.514	6.407	.000	Reject

R = 0.507, R^2 = 0.257, F-Value = 21.219, p-value < .000

Relatively, the regression analysis as presented in the same table shows that there are three (3) out of the four (4) factors of system thinking-based approach significantly influenced the conflict management of public elementary school heads of Maa District, Division of Davao City. Therefore, the established null hypothesis of this study that there are no factors of systems thinking-based approach that significantly influence the conflict management of

public elementary school heads of Maa District, Division of Davao City is rejected. Particularly, these systems thinking-based approach factors that have significant influenced in accordance to their t-value were the Cooperation to Advance School Improvement factor which obtained a t-value equal to 6.407 and a p-value < 0.000, the Preference factor which obtained a t-value equal to 4.091and a p-value < 0.000, and the Skill Set factor which obtained

a t-value equal to 3.032 and a p-value less than 0.000. On the other hand, the School Management factor of systems thinking-based approach does not significantly influence the conflict management of public elementary school heads of Maa District, Division of Davao City since it obtained a t-value equal to 0.698 and a p-value less than 0.486. Furthermore, the regression analysis revealed an R-squared (R2) value of 0.257, indicating that 25.7 percent of the variance in conflict management among public elementary school heads in Maa District, Division of Davao City, can be explained by a system thinking-based approach. In statistical terms, this means that the model, which incorporates systems thinking as a predictive variable, has a moderate level of predictive power, but it's far from a complete explanation. The R2 value serves as a quantitative measure of the effectiveness of the system thinking-based approach in explaining conflict management. Therefore, the study establishes that employing a systems thinking-based approach has a statistically significant but not all-encompassing influence on how school heads manage conflict. However, it is crucial to note that the remaining 74.3 percent of the variance is attributed to factors not included in this specific study. These "other indicators" could encompass a wide range of variables like individual leadership styles, cultural influences, resource availability, or interpersonal relationships among staff. Since these variables were not accounted for in the model, they represent a gap in the research that could be explored in future studies. By including additional indicators, future research could offer a more comprehensive understanding of what influences conflict management among public elementary school heads in Maa District, Division of Davao City. This finding is consistent with the research of Basile, Dominici, and Tani (2016), which found that the rationale for the diverse systemic approaches was an effort to move beyond the conventional reductionist-analytical paradigm that was used to understand complex phenomena. The numerous consequences resulting from interactions between heterogeneous and autonomous pieces are taken into account by system thinking. The system theories recognize that the whole and its pieces exist concurrently but at various levels in this fashion. These systems can be studied at several levels, emphasizing several semi-autonomous structures, as Anderson and Meyer (2016) noted that they have "tangled composite" structures. They went on to explain that the agents would function and communicate at each level, even with those at lower levels, to co-evolve and adapt. Additionally, Naim, Gosling, and Holweg (2019) explained that different system theories share a number of traits that enable the emergence of a universal language to guide and contextualize complex models of interaction between various system components without straying outside the bounds of complex adaptive systems.

4. Conclusions and Recommendations

This section presents the findings of the study based on the data outcome. The conclusions drawn from the findings of the study are likewise outlined in this section. To maximize the significant contribution of this study, the researcher has laid down recommendations in this chapter.

4.1. Findings—This non-experimental research using correlation design in this study aimed to determine the extent of systems thinking-based approach and the extent of conflict management of public elementary school heads. Specifically, this study aimed to determine the extent of system thinking-based approach in terms of preference, school man-

agement, skillset, and cooperation to advance school improvement. Moreover, this identified the extent of conflict management of public elementary school heads in terms of operation, regulatory direction, control, intelligence, and policy. Finally, this study determined the significant relationship between the extent of system thinking-based approach and the extent of conflict management of public elementary school heads. Using non-experimental research, the extent of system thinking-based approach and conflict management of public elementary school heads was determined. The respondents of the study were the 250-public elementary school teachers in Maa District, Division of Davao City. A modified teacher-made survey questionnaire was adapted from the study of Magallanes (2020) and was utilized as the main instrument of this study. After thorough analysis, significant findings showed that the extent of system thinking-based approach in terms of preference, school management, skillset, and cooperation to advance school improvement was extensive. Similarly, the extent of conflict management of public elementary school heads in terms of operation, regulatory direction, control, intelligence, and policy was very extensive which means that it was always evident. Hence, the extent of systems thinking-based approach as demonstrated by public elementary school heads was extensive. The overall p-value is equal to 0.000 with an r-value equal to 0.614. This means that there is a strong positive significant association between the systems thinking-based approach and conflict management of public elementary school heads of Maa District, Division of Davao City. Hence, this study rejects its established null hypothesis. The analysis further implies that an increasing utilization of systems thinking-based approach by the public elementary school heads of Maa District, Division of Davao City leads to an increase of their conflict management. Finally, indicators of system thinking-based approach such

as cooperation to advance school improvement, preference, and skillset have a strong influence of conflict management of public elementary school heads.

4.2. Conclusions—Based on the findings of this study, the following conclusions were offered: The system thinking-based approach was extensive. The conflict management of public elementary school heads was very extensive. There was a strong positive correlation in the extent of system thinking-based approach and the extent of conflict management practices of public elementary school heads based on the indicators. Based on the results revealed, the following have a strong influence of conflict management of public elementary school heads: Cooperation to Advance School Improvement, Preference, and Skillset. On other hand, school management indicator does not relate to the system thinking-based approach and conflict management of public elementary school heads.

4.3. Recommendations—The following interventions were offered based on the conclusions of the study:

School heads encourage a holistic view to emphasize the interconnectedness of all the components within the school system. Encourage teachers and staff to understand how their individual actions can impact the entire school community. School heads should foster open communication to create channels for open and transparent communication amongst all stakeholders. Regularly communicate the school's goals, values, and progress to build mutual understanding and collaboration. School heads should provide professional development on systems thinking to offer workshops or training sessions on systems thinking to help staff members understand the concepts and apply them in their day-to-day work. The results of this study could serve as a jumping off point for future researchers to perform a study on a related topic with a wider scope to explore the study's other elements.

5. References

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