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Teacher Workload and Approaches in Teaching Mathematics

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ABSTRACT: This study focused on the relationship between teacher workload and approaches in teaching Mathematics. Specifically, it determined the extent of teacher workload and the level of approaches in teaching Mathematics, their significant relationship, and the workload components that significantly predict approaches in teaching Mathematics. The study employed correlational and causal research designs. The respondents of the study were 153 Grade 10 students from Manolo Fortich District II, Division of Bukidnon, selected through stratified random sampling and the sample size was computed using Select Statistical Services Calculator at 95% confidence level and 5% margin of error. Data were gathered using an adapted validity and reliability tested questionnaire. Mean, Standard Deviation, Pearson Product Moment Correlation, and Multiple Linear Regression Analysis were utilized to examine the data. Findings revealed that teachers' workload is highly evident and the approaches in teaching Mathematics are high. There is a significant relationship between teacher workload and approaches in teaching Mathematics. Teaching load and administrative tasks are significant predictors in teaching Mathematics. The study concludes that teaching load and administrative tasks significantly influence the teaching approaches in Mathematics. Thus, school administrators may review and rationalize teachers' teaching loads and administrative assignments to allow more time for lesson preparation and instructional innovation. Furthermore, future researchers may conduct similar studies using other variables such as teaching experience, school resources, or student achievement.

KEYWORDS: administrative tasks, approaches in teaching Mathematics, teacher workload

I. INTRODUCTION

Mathematics is a complex component of the academic curriculum. It calls for clear instruction, adaptability, and involvement from teachers in addition to the mental work of students. How well students understand mathematical ideas and develop their problem-solving abilities is greatly influenced by the quality of instruction. Unfortunately, the decisions teachers make about how to teach are frequently influenced by the realities they encounter, particularly the demands of their workload. In a global context, students' academic achievement and future competitiveness in a globalized economy are seen as being critically dependent on Mathematics. The Philippines placed 76th out of 81 participating nations and economies in the most recent Programme for International Student Assessment (PISA) 2022 in Mathematics, with an average score of 355, lower than the OECD average of 472 (OECD, 2023). This result consistently shows performance gaps across countries and emphasizes the importance of teaching quality and instructional practices. The global context makes it clear that improving instructional practices in Mathematics needs not only skilled teachers but also reasonable workloads. These workloads must allow teachers to concentrate on providing high-quality teaching and learning. Teacher workload includes all the tasks and responsibilities they manage, such as lesson planning, classroom instruction, administrative duties, and student support (Nguyen & Brown, 2022). When these tasks become too much, teachers may feel stressed and tired. This often leads them to choose teaching strategies that require less time. Teachers with heavier workloads tend to rely on lecture-based instruction because it needs less preparation than problem-based learning or technology-based methods. This shows a direct link between workload and instructional choices. Instructional choices refer to the different methods, strategies, and practices that teachers use to present lessons and guide students in learning (Anthony & Walshaw, 2020). These choices determine how content is delivered, how activities are structured, and how students engage with the material. In education, instructional choices are applied when teachers select approaches such as lectures, discussions, group work, or technology-based activities to meet learning objectives. They are important because they influence student understanding, participation, and overall academic achievement. In Mathematics, the methods teachers choose are vital. They

affect how students engage with abstract concepts and improve their problem-solving skills. However, the different teaching methods available, like lectures, technology-enhanced learning, and problem-based learning, require different levels of preparation and classroom management. Flores and Ramirez (2022) noted that while using technology in teaching can enhance learning and encourage student engagement, many teachers find it burdensome due to the extra planning it requires. Thus, teachers' workload heavily influences whether they use new or traditional teaching methods. Moreover, the connection between workload and instructional choices highlights the need for support from institutions. Sorensen and Robertson (2022) suggested that reducing teaching hours and administrative duties can help teachers use more innovative and student-centered practices in Mathematics. When workloads become overwhelming, teachers tend to prioritize simpler strategies over better teaching methods. This compromise not only affects the quality of teaching but also impacts students' learning experiences. Furthermore, the provisions of Section 13 of Republic Act No. 4670, known as the Magna Carta for Public School Teachers, indicate that any teacher involved in direct classroom instruction shall not be obliged to teach more than six (6) hours each day, extendable only to eight (8) hours under exigent circumstances. This legal provision underscores the importance of preserving time for lesson preparation, assessment, and other essential professional tasks. Complementing this, DepEd Order No. 5, s. 2024 clarified that teachers should spend six hours on classroom instruction and two hours on ancillary tasks, aligning with the Magna Carta for Public School Teachers. DepEd issued Order No. 002, s. 2024, with the explicit aim of offloading administrative duties from teachers and transferring them to newly created non-teaching positions. Thus, the main objective of this study was to examine how various dimensions of workload specifically teaching load, administrative responsibilities, and student-related tasks influence the teachers' instructional choices in Mathematics. It also sought to find out if these workload factors not only relate to but also predict the selection of teaching methods. The study also aimed to promote better support systems for teachers, encourage a fair distribution of responsibilities, and strengthen teaching strategies that meet quality education standards. The study was anchored on the Job Demands-Resources (JD-R) Model by Bakker et al. (2021). The JD-R Model explains how workplace demands and available resources interact to shape employee outcomes like motivation, well-being, and job performance. For Mathematics teachers, these demands include heavy teaching loads, administrative paperwork, and responsibilities related to students, all of which can use up time and energy. Job resources are elements that support teachers in achieving their work objectives, reducing stress, or promoting development. Additionally, when the pressures faced by teachers surpass the resources they have, they are more prone to experiencing burnout and may default to survival-focused methods like lecture-based teaching. This approach, while efficient, often limits opportunities for deeper student engagement. Conversely, when demands are balanced with adequate resources, teachers are more inclined to adopt innovative practices. These may include technology integration and problem-based learning, which foster active participation and higher-order thinking (Villanueva, 2022). Additionally, Bautista et al. (2022) highlighted that Filipino Mathematics teachers facing high workload pressures often relied on traditional, lecture-based methods. These approaches required less preparation compared to constructivist strategies. This made them a more manageable choice under demanding conditions. Moreover, Skaalvik and Skaalvik (2021) pointed that teachers experiencing role overload reported lower motivation to employ interactive teaching methods. This was because the effort required to sustain such approaches exceeded the resources available to them. Their findings emphasized the direct link between workload pressures and the likelihood of teachers relying on less demanding instructional strategies. In contrast, McCarthy et al. (2021) observed that teachers who received strong support from school leaders were better able to manage workload demands. With sufficient backing, these teachers were more likely to implement richer and more effective instructional practices. This demonstrates how resources can buffer the negative impact of high demands on teaching quality. Such dynamics between demands and resources directly connect to the central focus of the present study.

II. METHODOLOGY

The researcher employed correlational and causal research designs, as this was considered the most appropriate for the study. It involved the description, analysis, and interpretation of conditions in a particular problem (Calunsag, 2024). This method mainly focuses on determining the relationship between teacher workload and approaches in teaching Mathematics. The respondents answered the adapted questionnaire to gather, analyze, and interpret data on identifying the relationships between and among the variables. In addition, the researcher employed a causal research design, which sought to understand cause-and-effect relationships by determining whether and how an independent variable influences a dependent variable. In education, this can involve examining whether specific interventions, such as increased administrative support, directly impact teachers' use of innovative instructional methods (Steiner & Kim, 2024). For the current study, a causal research design would be particularly relevant because it aimed to determine whether variations in workload with directly cause changes in teachers' Mathematics instructional choices rather than merely correlating with them. The statistical tools employed in this study facilitated the analysis

and interpretation of data in addressing the specific research problems and testing the hypotheses. Problems 1 and 2 utilized Mean and Standard Deviation. The Pearson Product Moment Correlation was used to examine the relationship between teacher workload and instructional choices in Problem 3. Finally, to identify which independent variables significantly predict instructional choices, either singly or in combination, Multiple Linear Regression Analysis was employed in Problem 4. Before using this statistical method, the researcher verified assumptions like the linearity of variable relationships and the normality of residuals rather than the variables themselves.

III. RESULTS AND DISCUSSION

Problem 1. What is the extent of teacher workload in terms of:

1.1 teaching loads;

1.2 administrative tasks; and

1.3 student-related responsibilities?

Table 1. Summary Result of Teachers' Workload

Teachers' Workload	Mean	SD	Qualitative Description
Teaching Load	3.42	1.18	Highly Evident
Administrative Tasks	4.17	0.99	Highly Evident
Student Related Responsibilities	4.14	0.95	Highly Evident
Overall	**3.91**	**1.04**	**Highly Evident**

Note: 4.21-5.0 Very Highly Evident; 3.41-4.20 Highly Evident; 2.61-3.40 Moderately Evident; 1.81-2.60 Less Evident; 1.0-1.80 Least Evident

Table 1 presents the overall teachers' workload. The results show a composite Mean of 3.91 with SD=1.04, qualitatively described as Highly Evident. This implies that teachers generally experience a high level of workload across teaching, administrative, and student-related responsibilities. Among the components, administrative tasks obtained the highest mean, indicating that non-teaching duties contribute most to teachers' workload. A highly evident workload suggests that teachers are consistently engaged in multiple professional roles that extend beyond classroom instruction. Teaching today involves not only lesson delivery but also documentation, reporting, coordination with stakeholders, and direct involvement in students' academic and personal development. According to Skaalvik and Skaalvik (2020) as well as Dinero and Oco (2024), teachers are often faced with a workload due to the nature of their professional roles, which not only involve teaching but also a number of other administrative and managerial tasks. The study revealed that tasks such as documentation, reporting, and involvement in school management tasks contribute significantly to the workload of teachers. The study highlighted that when these tasks are accumulated, they can put pressure on teachers as they try to juggle between their teaching roles and the expectations of the institution. Moreover, the study revealed that the workload can impact the job satisfaction and well-being of teachers if it is not managed effectively. This study supports the current finding that teachers have a number of roles in the school setting, which is evident in the high workload they exhibit. The variable Administrative Tasks obtained the highest Mean of 4.17 with SD = 0.99, qualitatively described as Highly Evident. This result shows that administrative responsibilities constitute the most prominent component of teachers' workload. Administrative tasks such as paperwork, reports, compliance with school requirements, and coordination with school administrators are integral to the smooth operation of educational institutions. However, the high rating implies that these tasks demand substantial time and effort from teachers, which may reduce the time available for instructional planning and direct student engagement. The prominence of administrative work underscores the increasing expectations placed on teachers to perform clerical and managerial duties alongside teaching. This finding aligns with the study of OECD (2020), which reported that teachers worldwide spend a significant portion of their working hours on administrative duties, often contributing to work overload and reduced job satisfaction if not properly managed. The variable Teaching Load registered the lowest Mean of 3.42 with SD = 1.18, qualitatively described as Highly Evident. Although still rated positively, this suggests that teaching load is perceived as slightly less demanding compared to administrative tasks and student-related responsibilities. This may indicate that teachers are relatively accustomed to instructional duties as part of their core role, or that teaching hours are more structured and predictable. However, a heavy teaching load can still pose challenges, particularly when combined with lesson preparation, assessment, and classroom management. Excessive teaching hours may lead to fatigue and reduced instructional quality if not balanced with adequate planning time. According to Sokal et al. (2020), high teaching demands, when coupled with additional

non-teaching responsibilities, can contribute to teacher stress and burnout, emphasizing the importance of workload distribution and supportive school policies.

Problem 2. What is the level of approaches in teaching Mathematics in terms of:
2.1 lecture-based;
2.2 technology-integrated; and
2.3 problem-based learning?

Table 2. Overall Approaches in Teaching Mathematics

Approaches in Teaching Mathematics	Mean	SD	Qualitative Description
Lecture-based	4.10	0.98	High
Technology-integrated	3.01	1.34	Moderate
Problem-based Learning	3.85	1.36	High
Overall	**3.65**	**1.22**	**High**

Note: 4.21-5.0 Very High; 3.41-4.20 High; 2.61-3.40 Moderate; 1.81-2.60 Low; 1.0-1.80 Very Low

Table 2 shows the overall Approaches in Teaching Mathematics. It has an overall Mean of 3.65 and SD = 1.22, qualitatively described as High and understood as Highly Observed. This result suggests that teachers use a blend of teaching methods in Mathematics at a high level, focusing strongly on both traditional and learner-centered strategies. A high degree of agreement indicates that students frequently encounter problem-solving exercises, clear explanations, and the use of technology in their education. Effective Mathematics teaching needs to balance direct instruction with active learning methods to encourage understanding of concepts and procedural skills. As noted by Cai et al. (2020), good Mathematics teaching combines different approaches to help students gain a deep understanding, reasoning skills, and a positive view of math. Among the three approaches, the highest-rated is Lecture-based teaching, which has a Mean of 4.10 with SD = 0.98. This is also rated as High. This indicates that teachers still rely heavily on direct instruction, explanations, and demonstrations when teaching Math concepts. Lecture-based teaching remains crucial in Mathematics, especially for introducing new topics, clarifying procedures, and showcasing problem-solving strategies. When done well, it gives students clear structure and guidance. According to Schleppegrell (2021), explicit instruction in Mathematics helps students grasp abstract concepts, mathematical language, and symbolic representations. However, while lecture-based teaching is useful, it becomes even more effective when combined with chances for discussion, application, and exploration. The lowest-rated approach is Technology-integrated Teaching, which has a Mean of 3.01 with SD = 1.34. This is qualitatively described as Moderate. Meanwhile, Problem-Based Learning still achieved a High level with a Mean of 3.85 and SD = 1.36. This suggests that although teachers often use real-life problems and inquiry-based tasks, the use of digital tools is not fully developed in Math classrooms. Technology can improve visualization, engagement, and immediate feedback, especially in abstract topics. Trust et al. (2022) support the idea that effective technology use in teaching relies on teachers' skills and confidence in using digital tools effectively. Enhancing technology use along with problem-based strategies can further boost Mathematics learning by making lessons more interactive, relevant, and focused on students.

Problem 3. Is there a significant relationship between the extent of teachers' workload and the level of approaches in teaching Mathematics?

Table 3 shows the Correlation Analysis between Teachers' Workload and Approaches in Teaching Mathematics. For Teaching Load, it recorded a computed r-value of 0.389 and a computed p-value of 0.000. The computed p-value is less than the critical p-value at the 0.01 level of significance. This indicates that a significant low positive relationship exists between teachers' workload and approaches in teaching Mathematics when considering teaching load. Thus, the null hypothesis is rejected.

Table 3. Correlation Analysis Between Teachers' Workload and Approaches

Dimensions of Independent Variable	r-value	p-value	Description	Decision on Ho	Interpretation
Teaching Load	0.389**	0.000	Low Positive	Reject	Significant
Administrative Tasks	0.206**	0.000	Low Positive	Reject	Significant
Student Related Responsibilities	0.494**	0.000	Low Positive	Reject	Significant

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

Teacher Workload and Approaches in Teaching Mathematics

Teaching load significantly shapes how teachers apply instructional methods in Mathematics. Teachers are more likely to carefully organize classes, select appropriate methodologies, and employ a variety of teaching techniques when their workload is manageable. On the other hand, a heavy teaching load may reduce the time teachers have for lesson preparation, reflection, and innovation, which can impact the quality of instruction given to students. According to García-Carmona et al. (2021), teachers with balanced workloads show greater instructional effectiveness and are better equipped to use student-centered and innovative teaching methods. The intensity of workload affects teachers' instructional choices, motivation, and ability to maintain high-quality teaching practices directly. For Administrative Tasks, it reported a computed r-value of 0.206 and a computed p-value of 0.000. The computed p-value is less than the critical p-value at the 0.01 level of significance. This means that a significant relationship Low Positive exists between teachers' workload and approaches in teaching Mathematics when looking at administrative tasks. Thus, the null hypothesis is rejected. Administrative tasks take up a large part of teachers' time and energy, which can impact their focus on instructional planning and delivery. When administrative responsibilities are too high, teachers may lean towards more routine or less innovative teaching methods due to limited preparation time. Reducing this administrative burden allows teachers to focus more on teaching, assessment, and student engagement in Mathematics. Collie and Martin (2020) indicated that a heavy administrative workload can harm the quality of teachers' instruction and their well-being, while streamlined administrative systems enable more effective teaching practices. For Student-Related Responsibilities, it recorded a computed r-value of 0.494 and a computed p-value of 0.000. The computed p-value is less than the critical p-value at the 0.01 level of significance. This shows that a significant low positive relationship was found between teachers' workload and approaches in teaching Mathematics when considering student-related responsibilities. Thus, the null hypothesis is rejected. Student-related responsibilities like mentoring, monitoring academic progress, addressing behavioral issues, and providing emotional support greatly influence how teachers approach instruction in Mathematics. Teachers who actively engage in these tasks usually adopt more responsive, adaptable, and supportive teaching methods that meet the needs of diverse learners. However, when these responsibilities become overwhelming, they can lead to teacher fatigue, which affects teaching consistency. According to Herman et al. (2021), meaningful interactions between teachers and students improve instructional responsiveness and enhance teaching methods, especially in Mathematics. Teachers who manage instructional duties alongside student-related responsibilities are more likely to use differentiated and inclusive teaching strategies that promote students' academic growth.

Problem 4. Which of the dimensions of the independent variable predict singly or in combination the approaches in teaching Mathematics?

Table 4. Multiple Linear Regression Between Teachers' Workload and Approaches

Dimensions of the Independent Variable	Unstandardized Coefficients		Standard Coefficient Beta		
	B	**Std. Error**		**T**	**Sig.**
(Constant)	1.069	0.363		2.948	0.004
Teaching Load	0.365	0.080	0.313	4.549	0.000
Administrative Tasks	0.243	0.092	0.296	2.647	0.009
Student Related Responsibilities	0.521	0.079	0.560	6.586	0.000
	R=0.583		$R^{2=}$0.352	F=26.959	Sig.=0.000

Note: a. Dependent Variable: Teaching Approaches

b. Predictors: (Constant), Teaching Load; Administrative Tasks, Student Related Responsibilities

Table 4 presents the Multiple Linear Regression Analysis between Teachers' Workload and Approaches in Teaching Mathematics. The regression results show that Student-Related Responsibilities are the strongest and most significant predictor of teaching approaches (β = 0.560, t = 6.586, p = 0.000). The high beta coefficient and significant p-value indicate that student-related responsibilities greatly influence how teachers approach Mathematics instruction. This means that teachers who engage deeply with students' academic needs, track progress, and provide guidance are more likely to use responsive, adaptive, and learner-centered teaching methods. Therefore, student-related responsibilities are crucial in shaping effective instructional practices. Their predictive strength emphasizes their importance in the teaching process. This finding matches recent studies that highlighted how close teacher–student interaction improves instructional responsiveness and teaching flexibility. According to Herman et al. (2021), teachers who actively connect with students' learning and emotional needs often adjust their teaching strategies to enhance understanding and engagement. Student-focused responsibilities promote differentiated instruction and diverse

approaches, especially in Mathematics, where students' needs and skills vary widely. Additionally, Teaching Load was also identified as a statistically significant predictor of teaching approaches (β = 0.313, t = 4.549, p = 0.000). This shows that teaching load meaningfully contributes, but to a lesser extent than student-related responsibilities, in determining how teachers approach Mathematics instruction. A manageable teaching load allows teachers to spend time on lesson planning, instructional innovation, and reflection, improving their teaching quality. When the teaching load is balanced, teachers are better able to use interactive and student-centered strategies instead of relying on routine or lecture-based methods. This finding is supported by Kim and Asbury (2020), who discovered that teachers with manageable workloads have higher instructional motivation and creativity.

Moreover, Administrative Tasks were also a significant predictor of teaching approaches, though they had lower predictive strength (β = 0.296, t = 2.647, p = 0.009). While many see administrative duties as secondary to instruction, their presence in the regression model indicates they still affect teachers' approaches to teaching Mathematics. Excessive administrative demands may limit instructional time and energy, while well-organized administrative systems can help teachers focus more on their teaching. According to Collie and Martin (2020), the administrative workload significantly impacts teachers' instruction and well-being, shaping classroom practices. Furthermore, the regression model as a whole was found to be statistically significant (F = 26.959, p = 0.000), with an R value of 0.583 and an R^2 of 0.352. This indicates that about 35.2% of the differences in teachers' approaches to teaching Mathematics can be explained by teaching load, administrative tasks, and student-related responsibilities. This level of explanatory power suggests that these aspects of teachers' workload collectively influence instructional approaches. However, other factors, such as school leadership, professional development, and individual teacher traits, may also affect teaching practices. Torres (2022) emphasized that while workload factors strongly predict teaching practices, effective instruction arises from the combination of organizational support, teacher competence, and contextual conditions. Overall, the results highlight Student-Related Responsibilities as the most significant predictor of teachers' approaches in teaching Mathematics, followed by Teaching Load and Administrative Tasks. This indicates that while all workload aspects predict teaching approaches, those directly linked to student engagement and learning have the most substantial impact. This underscores the importance for schools and policymakers to focus on workload structures that enhance meaningful teacher-student interactions, balanced teaching assignments, and streamlined administrative processes. By addressing these areas as a whole, schools can foster conditions that allow teachers to adopt more effective, responsive, and learner-centered approaches in Mathematics instruction. This can be summarized in the following regression equation model:

Model $Y=0.365X1+0.243X2+0.521X3+1.069$

Where: 1.069 = Constant

Y = Teaching Approaches

X_1 = Teaching Load

X_2 = Administrative Tasks

X_3 = Student Related Responsibilities

The multiple linear regression model derived from Table 10 indicates that teaching approaches are significantly predicted by the combined effects of the three workload dimensions, with the constant value of 1.069 representing the baseline level of teaching approaches when all predictors are held constant. The unstandardized coefficient for Teaching Load (B = 0.365) suggests that a one-unit increase in teaching load leads to a 0.365-unit increase in teaching approaches, holding other variables constant, implying that a manageable teaching load supports more effective instructional practices. Similarly, Administrative Tasks yielded a coefficient of B = 0.243, indicating that an increase in administrative responsibilities corresponds to a 0.243-unit increase in teaching approaches, though with a comparatively smaller effect. Notably, Student-Related Responsibilities emerged as the strongest predictor (B = 0.521), indicating that a one-unit increase in student-related responsibilities results in a 0.521-unit increase in teaching approaches, underscoring the central role of direct teacher–student engagement in shaping instructional approaches. Overall, the model confirms that teachers' workload dimensions collectively and significantly predict teaching approaches, with student-related responsibilities exerting the greatest influence, followed by teaching load and administrative tasks.

IV. CONCLUSIONS

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

1. Teachers are able to manage their teaching workload.
2. Teachers employ a range of teaching approaches in Mathematics despite experiencing high levels of workload.
3. Teacher workload is associated with approaches in teaching Mathematics.
4. Teaching load and administrative tasks significantly influence the implementation of teaching approaches in Mathematics.

V. RECOMMENDATIONS

Based on the findings and conclusions of the study, the following recommendations are offered:

1. Teachers may continue to balance and manage their workload.
2. Teachers may continue to incorporate technology-integrated and problem-based learning approaches, especially when institutional support and preparation time are available.
3. School administrators may review and rationalize teachers' teaching loads and administrative assignments to allow more time for lesson preparation and instructional innovation.
4. School administrators may strengthen professional development programs and Learning Action Cells (LACs) focused on efficient workload management and diverse approaches in teaching Mathematics.
5. Future researchers may conduct similar studies using other variables such as teaching experience, school resources, or student achievement, or replicate the study in other districts or subject areas to validate and expand the findings.

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