ISA Journal of Multidisciplinary (ISAJM)

Homepage: https://isapublisher.com/isajm/

Volume 3, Issue 2, March-April, 2026 ISSN: 3049-1851

"Mix, Match, Master": Elevating Motivation and Mathematics Performance

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Received: 11.03.2026 | **Accepted:** 10.04.2026 | **Published:** 11.04.2026

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DOI: *10.5281/zenodo.19509446*

Abstract **Review Article**

Mathematics is still considered one of the most challenging subjects for Grade 8 students, particularly in Algebra, where students show poor academic performance and low motivation levels. This study aimed to examine the effectiveness of the Mix, Match, Master intervention strategy in improving students' Algebra performance and their motivation levels. Using quantitative, quasi-experimental research, Grade 8 participants from the intact classes of Magalang and Maaasahan at Cordon National High School during S.Y. 2025 – 2026 were assigned to traditional and intervention groups through purposive sampling. The data were gathered employing researcher-made test questionnaires (pretest and posttest) and a survey questionnaire (motivation levels), and analyzed using descriptive and inferential statistics. Findings revealed that a comparable level of motivation was observed in the experimental group before and after the intervention, but a significantly higher performance in Algebra was noted among them compared to the traditional group. Moreover, no significant relationship was established between motivation levels and academic achievements. It is evident from the findings that the Mix, Match, Master strategy is an effective instructional strategy in improving students' Algebra skills. It is recommended that educators and future researchers investigate the application of other strategies in other subjects and classes to ascertain their generalization and impact on students' learning.

Keywords: Linear Equation, collaborative learning, reward-based strategy, motivation, achievement, Mix Match Master.

Introduction

Learning Mathematics is found to be tough due to its complexities that help the students to enhance their numerical and logical thinking skills, assisting them to make meaning in their overall academic performance. On the other hand, Grade 8 students often face difficulties in their Algebra subject, specifically in Linear Equation-related concepts, which require them to employ their abstract reasoning and computational skills.

Studies such as Mediana and Hinacay (2025) and Larbi et al. (2025) have shown that having decreased motivation levels and declined academic achievement in Mathematics is negatively related to students' overall achievement, specifically in simplifying algebraic expressions. This mentioned

empirical finding highlighted the essence of targeted intervention. With this, according to Gapasin (2025), teachers should design intervention strategies that center on the academic progress of the students to prepare them for global competitiveness.

Gerome and Smith (2021) emphasized that Mathematics 8 subject demands critical thinking and contextual problem-solving skills, making it difficult for students to deal with it. Also, in teaching this subject, there is still a need to consider the diversity of the students, such as their learning styles, utilizing collaborative learning, integration of technology, and differentiated instruction (Rodriguez, 2022). Aside from this, there are few studies tested the amalgamation of the mentioned approaches within a single intervention strategy (Alzubi et al., 2024).

To address these gaps, this study introduces a quasi-experimental approach rooted in social learning and motivational theories. This intervention strategy is called Mix, Match, Master. This intervention utilizes a pairing system, collaboration, and reward-based approach to improve the students' motivational levels that may translate to their academic performance in Mathematics, specifically in Algebra.

Hence, this study is intended to evaluate the effectiveness of the Mix, Match, Master intervention strategy in elevating motivation levels and mathematics performance among Grade 8 students.

Methodology

This research utilized a Two-Group, Pretest-Posttest Quasi-Experimental Design with control and intervention groups. The participants were 78 grade 8 students from two intact classes at Cordon National High School, who went through homogeneity testing using a standardized diagnostic test (Levene's test = 1.568, p = 0.214), consisting of 40 students in the Control Group (traditional group) and 38 students in the Experimental Group (Mix Match Master Group). The experiment began with a pre-assessment for both groups to ascertain comparable baseline knowledge about mathematics. During the intervention phase, the Experimental group went through a combination of traditional teaching and the intervention, which utilizes a pairing system, collaboration, and a reward-based approach. The control group was taught strictly using the traditional lecture-based methods.

The researcher utilized a teacher-made algebra pretest-posttest, validated by experts for content and reliability, and an adapted and pilot-tested 24-item Mathematics Motivation Scale from Zakariya and Barattucci (2021) (α = 0.79; acceptable) as the primary instruments for data collection. Statistical tools used to analyze the data included mean and standard deviation to describe performance and motivational level, independent samples t-tests to determine significant differences between groups, and paired-samples t-tests to evaluate significant differences within groups. Additionally, Levene's test was used to ascertain comparable baseline knowledge before the experiment, the Shapiro-Wilk test to determine the normality of data, and Cohen's d was calculated to measure the effect size and practical significance of the Mix, Match, Master strategy. Pearson's Product-Moment Correlation Coefficient was used to test the relationship of the variables. Ethical considerations, including informed consent and confidentiality, were observed throughout the research process.

Results and Discussions

Table 1. Motivational Level of Participants before and After the Implementation of the Mix, Match Master Approach in the Intervention Group

Phases	Mean	SD	Description	T	p-value	Cohen's d	Decision
Before Implementation	2.93	0.300	Motivated	-1.532	0.134	-0.249	Fail to reject Ho

After Implementation	3.03	0.397	Motivated

Legend:

3.25 – 4.00 – Highly Motivated
2.50 – 3.24 – Motivated
1.75 – 2.49 - Slightly Motivated
1.00 – 1.74 - Not Motivated

Table 1 presents the motivational level of participants before and after the Mix, Match, Master intervention strategy implementation in the experimental group. Based on the table, the mean increased from 2.93 (Motivated) before the implementation phase to 3.03 (Motivated) after the implementation phase. This shows that there is a positive shift in motivation of the participants after the intervention strategy, though the change is modest. Paired-samples t-test reveals that the difference in motivation was not statistically significant, $t(19) = -1.532, p = 0.134$, suggesting that the Mix, Match, Master strategy did not produce a statistically significant change in the motivational level of the participants.

Even though there was no statistically significant increase, the Mix, Match, Master intervention demonstrated a slight upward trend in the motivational levels of the participants. This finding is supported by the result of Cohen's d (-0.249), indicating a small effect size. This means that the enhancements were minimal but present. That is, the intervention may have affected motivation, but it was too small to be considered substantial. This underscores that motivation complexities are not easily changed using a single intervention, and a further refinement of the intervention to toughen intrinsic and extrinsic motivation without negotiating confidence.

The observed increased of the mean suggested that even though the shifting of motivation was limited, the intervention strategy still managed to slightly improve students' motivational orientation in the experimental group. This finding aligned with the argument of Gapasin and Baustista (2022) in their GALAK-TUWA intervention strategy. According to them, improvement of students depends on their level of participation, which reflects their motivation. That is, the higher the participation, the higher the probability of improvements and vice versa. Furthermore, the intervention strategy was efficient in sustaining participants' motivation, but it may need further improvement to yield a more significant enhancement in motivation, such as strengthening the strategies for active participation, peer collaboration, scaffolding, and challenging tasks. According to Svane et al. (2023), students' motivation in learning mathematics may improve if they are involved in active participation and peer collaboration. Also, they found out that while motivation scales, the students' confidence or self-efficacy is less consistent, which also mirrors the current study's findings. Rojo et al. (2024) further examined the mentioned factors, and they also found that the intervention that they used significantly affected outcomes in terms of scaffolding, collaboration, and challenge-seeking, which highlights a need for a supportive intervention strategy.

Table 2. Pretest and Posttest Mean Percent Scores in Algebra of the Participants

Phases	Groups	N	Mean Percent Scores	SD	t	p-value	Decision
Pretest	Mix, Match, Master Group	38	65.09	3.61	0.408	0.684	

	Traditional Group	40	65.46	4.35			Fail to reject Ho
Posttest	Mix, Match, Master Group	38	86.49	4.77	5.818	< .001	Reject Ho
	Traditional Group	40	80.21	4.76			

p-value ≤ 0.05 is significant

Results shown in Table 2 that the independent samples t-test reveals comparable performance (t = 0.408; p = 0.408) of both groups during the pretest, the Mix Match Master group (MPS = 65.09, SD = 3.61) and the traditional group (MPS = 65.46, SD = 4.35), indicating that the null hypothesis is not rejected. This establishes baselines of the two groups and ensures objectivity in evaluating the effect of the intervention strategy, which was emphasized by Bailey et al. (2026).

Furthermore, after the experiment, the Mix, Match, Master group recorded significantly higher posttest scores (MPS = 86.49; SD = 4.77) as compared to the traditional group (MPS = 80.21; SD = 4.76), with t-test results (t = 5.818; p = <0.001). This implies that the experimental group performed better; thus, the intervention strategy yielded great and measurable improvements in students' performance.

This implication resonates with the study Limbago-Bastida and Bastida (2022). They found that students taught using innovative intervention performed significantly better than those who were taught using traditional methods. This cited literature and implications of this study accentuated that innovative intervention strategies like Mix, Match, Master improve not only academic performance but also confirm the need for a pedagogical shift toward structured and collaborative processes in curriculum design and future research.

Table 3. Comparison of the Mean Difference of the Posttest and Pretest in Algebra of the Participants

Groups	Pretest	Posttest	Mean Gain	SD	T	p-value	*Cohen's d*	Decision
Mix, Match, Master Group	65.09	86.49	21.40	5.24	5.521	<0.001	1.215	Reject Ho
Traditional Group	65.46	80.21	14.75	5.40				

p-value ≤ 0.05 is significant

The comparison of the mean gain scores in algebra between the two experimental groups, shown in Table 3, reveals a statistically significant difference ($t = 5.521, p < .001$), showing that the Mix Match Master Group obtained a higher mean gain of 21.40 (SD = 5.24) compared to the Traditional Group's mean gain of 14.75 (SD = 5.40). The noted difference indicates that participants exposed to the combination of traditional methods and the Mix, Match Master strategy gained a greater improvement in their Algebra performance than those who were taught strictly using traditional methods. The relatively close variability of scores in both groups indicates comparable distribution of scores, making the difference in mean gains more meaningful.

The table also highlighted the Cohen's d value of 1.215, indicating a large effect size, implying that the Mix, Match, Master strategy

produced a substantial and meaningful improvement in students' algebra performance compared to the traditional teaching method. This indicates that a typical student exposed to the Mix, Match, Master strategy would outperform the majority of the students in the traditional group, demonstrating a significant educational effect. As a result, the intervention works very well to help students do better in algebra. This means that teaching strategies such as the Mix, Match Master strategy, which gets students involved and provides them with structured chances for mastery, can help them perform better in mathematics. According to Vale and Barbosa (2023), if a strategy provides active learning opportunities for students, they cannot feel any threats, allowing them to reflect and be conscious of their thoughts, mistakes, and challenges (mathematical communication), as well as to their classmates (collaboration), as they do mathematics, which later translates to their academic performance.

Moreover, it is worth noting that this intervention is a very effective pedagogical strategy in enhancing Algebra outcomes among Grade 8 students, and therefore, this result implies that by incorporating elements of active learning and mastery in teaching, there is a high potential to improve students' performance academically beyond what is possible with conventional teaching strategies.

The study's findings are closely connected to the experiential learning theory by David Kolb. This theory emphasizes that students can gain a deeper understanding when they actively participate in meaningful learning tasks and reflect on their experience (Cloke, 2024). In this connection, the intervention of this study was experiential in nature; participants were able to build knowledge through hands-on activities and collaborative processes that led to enhanced outcomes. Besides, Perez and Gapasin (2025) applied this theory in their "*RE-COUNTING*" intervention and revealed comparable results, accentuating that experiential teaching strategy enhances retention and comprehension. With their significant findings, they further recommended that teachers should consistently include experiential strategies in their teaching and learning processes to ensure that learning is practical and transformative.

Table 4. Relationship between the Mean Gain Scores in Algebra and the Motivational Levels of Mix, Match, Master Group

r - value	p-value	Decision	Interpretation
-0.048	0.774	Fail to reject Ho	Very weak negative correlation

Legend:

±0.80 – ±1.00	Very strong correlation
±0.60 – ±0.79	Strong correlation
±0.40 – ±0.59	Moderate correlation
±0.20 – ±0.39	Weak correlation
±0.00 – ±0.19	Very weak correlation

The relationship between the mean gain scores in Algebra and the motivational levels of the intervention group is measured to be a very weak negative correlation ($r = -0.048$, $p = 0.774$), as shown in Table 4, indicating that the relationship between the two measured variables is not statistically significant. This means that the changes in the motivational levels of the participants are not meaningfully associated with their gains in Algebra performance. The observed very weak negative correlation indicates that though students generally demonstrated increased performance in Algebra,

such improvement was not directly associated with the measured level of motivation noted. This implies that students with higher motivational levels did not necessarily achieve greater mean gains, and those with lower motivation were still able to demonstrate improvement in their performance.

Similarly, Bin Abdulrahman et al. (2023) concluded that motivation had no effect and no significant correlation on academic performance; the sole factor that had a positive correlation with academic performance is learning engagement. This also explains the mentioned implications of this study. That is, students may get high mean gains, but these do not reflect on their motivation levels, whether low or high.

With the results and cited literature, the observed mean gains in Algebra performance may be more significantly affected by the instructional efficacy of the Mix, Match, Master Strategy rather than by the participants' motivational levels alone. This supports the idea that well-organized and engaging teaching methods can help fill in gaps in learning, even if students' motivation levels differ.

Acknowledgment:

The researcher would like to express his gratitude to the people who contributed unselfishly their insights, time, and effort that made this study successful. First and foremost, to the Lord God, who gave faith and strength, good health, infinite guidance, love, and wisdom throughout the completion of this study; To Dr. Hermenegildo F. Samoy Jr., President of the university, for his brilliant suggestions that contributed to the completion of the study. To the Program Chairperson of MAT-Mathematics, thesis adviser, and statistician, Dr. Nelson D. Guray, his expertise, generous contribution of ideas, and technical skills were instrumental in helping to reach the complexities of this research. The researcher would also like to extend special thanks to the members of his review committee, Dr. Rosalyn L. Delizo, Dr. Cynthia Grace T. Valdez, Dr. Rey C. Naval, and Dr. Eleanor C. Macapal, whose expertise greatly contributed to the research design and execution. Their perspective and constructive criticism were invaluable. The researcher also wishes to thank Dr. Rachel R. Llana, Dr. Vilma L. Villador, and Cordon National High School for providing access to the necessary resources and support for the research. To his mother, Marilina Carbonel Duyag and Wife Elizabeth I. Butalan, siblings, friends, and brethren of the Church of Christ, for the love and moral support that served as inspiration in pursuing this research.

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