



Personal Characteristics, Educational Attainment and Professional Practice as Dimensions of Mathematics Teachers: Towards an Intervention Framework

DOI: 10.5281/zenodo.23683612

Reymundo S. Cahiyanga

Western Colleges, Inc., Naic, Cavite

Abstract:

This study examined personal characteristics, educational attainment, and professional practices as dimensions of Mathematics teachers in the Division of General Trias City, Cavite, towards the development of an intervention framework. The research addressed the persistent challenges in Mathematics education where teacher quality is recognized as a critical determinant of student interest, persistence, and achievement. Using a descriptive-correlational research design, the study involved 93 public secondary Mathematics teachers selected through total enumeration. Data were gathered using a researcher-made validated questionnaire composed of three dimensions: personal characteristics (patience and empathy, clear communication, adaptability, passion and enthusiasm, organization, approachability, caring and supportive), educational attainment (formal qualifications, teacher preparation, professional examinations), and professional practices (goal setting, reasoning and problem-solving, mathematical discourse, purposeful questioning, conceptual understanding, varied techniques, real-world connections, monitoring and assessment, feedback, positive environment, high expectations, adaptability, extra support, professional development). Statistical tools included frequency, percentage, weighted mean, t-test, and Pearson r. Results showed respondents were predominantly mature professionals aged 40-44, slightly more males than females, majority with MA/MS/MST units, and most with 20-24 years of service. Personal characteristics were rated as somewhat personal (composite mean=2.47), educational attainment as somewhat attained (composite mean=2.51), and professional practices as somewhat practiced (composite mean=2.63). Significant differences were found in assessments when grouped by age, sex, educational attainment, and length of service. Significant positive correlations were found between personal characteristics and educational attainment ($r=0.214$, $p=0.039$) and between educational attainment and professional practices ($r=0.313$, $p=0.002$), while personal characteristics and professional practices showed no significant correlation. Based on the lowest rated indicators, an intervention framework was proposed focusing on clear communication, state-required exam preparedness, and provision of extra support. The study recommends continuous professional development, mentoring, and institutional support to strengthen teacher effectiveness.

Keywords: personal characteristics, educational attainment, professional practice, Mathematics teachers, intervention framework, teacher quality

Introduction:

Mathematics plays an integral role in daily life, science, technology, and national development. It develops analytical, critical, and problem-solving skills essential for informed decision-making and participation in the modern workforce. The importance of mathematics in a country's growth makes students' mathematical performance a highly sought-after and crucial topic in any educational system (Oladipo & Tomori, 2016; Malik, 2017). Despite its importance, Mathematics remains one of the most challenging subjects for many learners in the Philippines, as evidenced by low performance in national and international assessments such as the Programme for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS). This persistent underperformance raises questions not only about curriculum and learner factors but also about teacher-related variables.

At the heart of effective Mathematics education are teachers. Teachers are pivotal in inspiring a lifelong love for learning, shaping attitudes towards Mathematics, and preparing students for the challenges of a technologically advanced world. Teacher quality has been consistently identified as the most significant school-based factor influencing student achievement (Hanushek, 2011; Hattie, 2012). Effective Mathematics teachers possess more than



content knowledge; they integrate personal dispositions, academic preparation, and professional practices to create meaningful learning experiences. This study focuses on three dimensions: personal characteristics, educational attainment, and professional practice.

Personal characteristics encompass patience, empathy, adaptability, passion, and communication. Research indicates that personality traits significantly influence classroom climate, student-teacher interaction, and instructional effectiveness (Kenni, 2020; Child, 2003). Chamorro-Premuzic et al. (2007) found that emotional intelligence predicts teaching effectiveness, while Pekrun et al. (2009) linked achievement motivation to improved student outcomes. Teachers with positive personal attributes create supportive environments where students feel safe to take academic risks, ask questions, and persist through difficulties.

Educational attainment refers to formal academic qualifications, pedagogical training, and continuous learning. Human capital theory posits that teacher qualifications contribute directly to instructional quality (Aaronson et al., 2007). Evidence suggests that teachers with advanced degrees and subject-specific preparation produce higher student growth (Curry et al., 2018; Saucedo, 2017; Smith, 2016). However, findings are mixed; Barnett (2020) reported lower scores for students taught by teachers with advanced degrees, indicating that qualification alone is insufficient without alignment to pedagogical content knowledge (Baumert et al., 2010).

Professional practice includes instructional strategies, assessment, classroom management, and professional growth. The National Council of Teachers of Mathematics (NCTM, 2014) emphasizes effective teaching practices such as establishing clear goals, promoting reasoning, facilitating discourse, and connecting mathematics to real life. Studies show that student-centered, inquiry-based pedagogy enhances engagement and achievement (Gningue et al., 2013), while traditional practices focusing on low-level thinking contribute to negative attitudes and low achievement (Al-Harbi, 2020; Walkowiak et al., 2014).

In the Division of General Trias City, observations indicate variability in teacher effectiveness, with some teachers demonstrating strong content mastery but needing improvement in communication and learner support. There is a gap in localized empirical evidence that simultaneously examines personal characteristics, educational attainment, and professional practice and how these dimensions relate to each other. This study aims to address that gap.

Specifically, this study sought to: (1) describe the profile of Mathematics teachers in terms of age, sex, educational attainment, and length of service; (2) assess the extent of personal characteristics, educational attainment indicators, and professional practices; (3) determine significant differences in assessments when grouped by profile variables; (4) examine significant relationships among the three dimensions; and (5) propose an intervention framework based on findings. The results will provide school heads, master teachers, and policymakers with evidence-based insights for targeted professional development and teacher support programs.

Literature Review:

Personal Characteristics of Mathematics Teachers

Personality is defined as a dynamic organization of psychophysical systems that produces distinctive patterns of cognition, emotion, and behavior (Kenni, 2020). It predicts behavior across situations and distinguishes individuals (Child, 2003). In education, teachers' personality influences lesson control, learning processes, and teacher-student interaction. Self-awareness of personality allows teachers to evaluate communication and choose appropriate teaching strategies.

Research consistently links personality traits to teaching effectiveness. Chamorro-Premuzic et al. (2007) demonstrated that emotional intelligence enhances effectiveness by enabling accurate recognition of student emotional needs and creation of supportive environments. Pekrun et al. (2009) found achievement motivation correlates with high expectations and challenging tasks that promote learning. Ayanwoye et al. (2024) revealed that openness and agreeableness positively correlate with students' Mathematics achievement, with openness having the highest impact due to flexibility and innovation, while agreeableness fosters a supportive climate encouraging participation. Extraversion and conscientiousness showed mixed results.



Lukashova and Kadyr (2023) found that personality, communication preferences, and intelligence influence teaching style. Chimezie (2020) emphasized that personality is reflected in instructional activities, materials, strategies, management, and nonverbal communication. Sukawati et al. (2020) concluded that good personality is capital for interaction, professionalism, and performance, as problems in personality affect task execution. Strong (2017) as cited by Popoola et al. (2023) highlighted qualities such as ownership for classroom success, using personal experiences, respectful response, positive dialogue outside classroom, professionalism, confidentiality, trust, and admitting mistakes.

Tõeväli and Kikas (2016) in Estonia found that teachers' attributions of success to teacher help or failure to lack of ability negatively affected children's math performance, while task persistence positively predicted performance. Hapsari et al. (2017) identified characteristics of good Mathematics lecturers: mastering materials, punctuality, objectivity, understanding students, clarity, discipline, enthusiasm, friendliness, exemplary behavior, and preparation. Badiang (2023) stressed passion and enthusiasm as drivers of student engagement; bored teachers produce bored learners.

Educational Attainment

Teacher qualification is defined as special skills, experience, or knowledge making one suitable for a job (Merriam-Webster). It is one of the most critical factors driving student achievement and teacher performance (Munna & Kalam, 2021). Global policies invest heavily in improving teacher quality through qualification standards (Barbieri et al., 2011; Feng & Sass, 2018). Human capital theory supports qualification impact on hiring, salary, tenure, and evaluation (Aaronson et al., 2007; Podgursky & Springer, 2007).

Positive relationships between qualification and learning are widely documented. Bulilan (2023) found positive correlation between teaching competencies and educational attainment. Curry et al. (2018) and Saucedo (2017) found students with teachers holding master's degrees outperformed peers and showed higher Mathematics growth. Smith (2016) and NAEP data (2015) consistently show students taught by teachers with master's degrees outperform those taught by bachelor's holders in reading and math. Tasnim et al. (2020) argued advanced degrees improve competencies affecting student learning and licensure performance.

However, subject-specific preparation matters more than general advanced degrees. Bolyard and Moyer (2008) found secondary teachers with mathematics degrees positively impact achievement, while education degrees without mathematics show little or negative impact. Mathematics coursework positively relates to achievement but diminishes after certain courses and is influenced by course level. Baumert et al. (2010) warned that limited mathematical understanding harms pedagogical content knowledge and persists across careers. Gningue et al. (2013) found no relationship between increased content knowledge and use of student-centered teaching, while Son (2015) found in the US, teachers majoring in both education and mathematics are 2.4 times more likely to provide high-quality instruction than those with alternative paths, a pattern not found in Korea.

Contradictory findings exist. Barnett (2020) in Mississippi found students taught by teachers with advanced degrees had significantly lower scores in ELA and mathematics, suggesting context, quality of graduate programs, and alignment to classroom needs moderate the effect.

Professional Practice

Professional practice, as a domain of teaching, means making learning engaging and valued, creating safe, inclusive, challenging environments, implementing fair behavior management, using sophisticated communication, employing effective strategies, designing well-structured lessons, evaluating practice, and using assessment data to diagnose barriers (Domains of Teaching, 2017).

Teaching quality is among the most important factors affecting student progress (Akiba et al., 2007; Hattie, 2012). Mathematics teachers must control learning, outline materials, and plan daily lessons effectively (Noraini, 2006). Good teaching is associated with specific goals; better achievement indicates more effective teaching (Morris &



Hiebert, 2011; Fenstermacher & Richardson, 2005). Effective practices identified by NCTM (2014b) and researchers include experiential planning building on current competencies and interests through continuous assessment (Anthony & Walshaw, 2009), anticipating student solutions, observing responses, selecting presenters, sequencing answers, and linking responses (Smith & Stein, 2011).

Buser (2018) listed practices such as asking significant questions, building conceptual understanding before procedural fluency, connecting mathematical ideas, linking to real-world situations, using multiple representations, encouraging student speaking and writing, and diversifying lessons for diverse needs. Ding et al. (2007) noted collective actions encourage sharing and higher-order thinking, while Boston and Smith (2009) and Feiman-Nemser (2001) emphasized that rich dialog requires high teacher knowledge of student responses and content.

Poor performance on international tests is attributed to ineffective practices. Roberts (2013) stated methods impact understanding because mathematics remains complicated for many learners. Walkowiak et al. (2014) found divergence between NCTM vision and actual classroom practice. Al-Harbi (2020, 2021) pointed to adherence to traditional practices focusing on lower-order thinking and lack of real-world connection leading to negative attitudes. Al-Saeed (2018) added that ineffective practices lead to lack of cognitive understanding and increased mistakes. Al-Shammari and Al-Arini (2019) estimated teacher performance accounts for 60% of educational process.

Professional development and leadership also influence practice. Larson (2002) found effective teachers share commonalities regardless of discovery orientation. Ingvarson et al. (2004) identified four factors: knowledge, beliefs, understanding, and practice, plus qualifications, professional development, and experience. Ismail et al. (2015) cited gender, level, field, years, professional development nature, context, and strategies. Wardat et al. (2022a) found school environment and perception influence practice among 522 teachers in Abu Dhabi. Cady et al. (2006), Tatto et al. (2018), Munby et al. (2001) noted novice decision-making improves with confidence and seniority. Avidov-Ungar et al. (2014) and Shen et al. (2020) discussed teacher leadership empowerment as predominantly academic rather than reality in schools, while Mourão (2018) linked leadership to performance, commitment, and well-being. Membership in professional organizations provides experience, reduces isolation, and improves curricular integration (Mbulle, 2023; Schleifer et al., 2017).

This literature establishes that personal characteristics, educational attainment, and professional practice are interrelated but distinct dimensions warranting simultaneous investigation in the Philippine public school context.

Methodology:

This study employed a descriptive-correlational research design. Descriptive research was used to describe the profile and the extent of personal characteristics, educational attainment, and professional practices of Mathematics teachers. Correlational research was used to determine significant differences when grouped by profile and significant relationships among the three dimensions. This design is appropriate for examining naturally occurring variables without manipulation.

Research Locale and Population

The study was conducted in the Division of General Trias City, Cavite, Philippines. The respondents were 93 Mathematics teachers from public secondary schools, selected through total enumeration (census) to ensure comprehensive representation. Inclusion criteria were: currently teaching Mathematics in the division, with at least one year of service, and willing to participate.

Research Instrument

The researcher utilized a self-made questionnaire validated by three experts in Mathematics education and educational management (Cronbach's alpha = 0.89, 0.91, 0.93 for the three dimensions). The instrument consisted of four parts: Part I - Demographic profile (age, sex, educational attainment, length of service). Part II - Personal characteristics (7 items: patience and empathy, clear communication, adaptability, passion and enthusiasm, organization, approachability, caring and supportive) rated on a 4-point Likert scale: 4-Highly Personal (3.50-4.00), 3-Personal



(2.50-3.49), 2-Somewhat Personal (1.50-2.49), 1-Not Personal (1.00-1.49). Part III - Educational attainment indicators (4 items: bachelor's degree, teacher preparation program, student teaching, state-required exams) with scale: 4-Highly Attained, 3-Attained, 2-Somewhat Attained, 1-Not Attained. Part IV - Professional practices (14 items: goal setting, promoting reasoning, fostering discourse, purposeful questions, conceptual understanding, varied techniques, real-world connection, monitoring, feedback, positive environment, high expectations, adaptability and organization, extra support, professional development) with scale: 4-Highly Practiced, 3-Practiced, 2-Somewhat Practiced, 1-Not Practiced. Open-ended questions were included for qualitative insights.

Data Collection Procedure

Permission was obtained from the Schools Division Superintendent of General Trias City and school principals. The researcher personally distributed questionnaires after explaining purpose, confidentiality, and voluntary participation. Informed consent was secured. Data collection was conducted within two weeks in the first semester of SY 2024-2025. Retrieval rate was 100% due to follow-up visits. Ethical considerations included anonymity, confidentiality, and no coercion. Data were encoded and checked for completeness.

Statistical Treatment

Data were analyzed using SPSS v26. Frequency and percentage described profile. Weighted mean and composite mean measured extent of dimensions. T-test for independent samples determined significant differences when grouped by age (median split 40-44 vs 45-49), sex (male vs female), educational attainment (with master's degree vs with doctoral units), and length of service (20-24 vs 25-29 years). Pearson Product-Moment Correlation Coefficient determined significant relationships among dimensions at 0.05 level of significance. Tables, graphs, and a conceptual diagram of the intervention framework were generated.

Results and Discussion:

Profile of Respondents

The study involved 93 Mathematics teachers. Table 1 presents the demographic profile. Majority belonged to age group 40-44 (30.1%), followed by 45-49 (21.5%), 35-39 (19.4%), 50 and above (16.1%), and 30-34 (12.9%). This indicates a mature workforce at peak professional capacity. Regarding sex, 51.6% were male (48 teachers) and 48.4% female (45 teachers), showing near gender parity with slight male dominance unusual in Philippine basic education where females often predominate, suggesting Mathematics teaching attracts more males in this division.

For educational attainment, 45.2% had MA/MS/MST units, 26.9% MA/MS/MST graduates, 10.8% with doctoral units, 10.8% bachelor's degree holders, and 6.5% doctoral graduates. Majority are pursuing or have completed graduate studies, reflecting commitment to professional growth but also indicating incomplete graduate degrees as a gap. Length of service showed 30.1% with 20-24 years, 19.4% with 15-19 years, 18.3% with 25-29 years, 16.1% with 10-14 years, 10.8% with 5-9 years, and 5.4% with 1-4 years. The workforce is highly experienced, with over 67% having more than 15 years of service, implying deep tacit knowledge but potential need for updating with recent pedagogical innovations.

Figures 1-4 illustrate these distributions. The age and service profiles align with Ingvarson et al. (2004) and Cady et al. (2006) that seniority influences effectiveness and confidence. The mature profile suggests stability but also risk of pedagogical inertia if not supported by continuous professional development.

Personal Characteristics

Table 2 shows assessment of personal characteristics. Overall composite mean was 2.47 (SD=0.62), interpreted as Somewhat Personal, indicating moderate presence of desired traits. Highest rated was Passion and enthusiasm (Mean=2.89), followed by Caring and supportive (2.71), Approachability (2.58), Organization (2.45), Adaptability (2.38), Patience and empathy (2.32), and lowest was Clear communication (2.01). This pattern reveals that while teachers possess intrinsic motivation, they perceive difficulty in translating passion into clear, learner-friendly



explanations - a critical gap because Mathematics requires scaffolding of abstract concepts.

This finding supports Hapsari et al. (2017) that mastering and presenting materials clearly is core to good lecturing, and Badiang (2023) that passion must be coupled with clarity. The low score on clear communication aligns with Philippine classroom observations where teacher talk is often procedural rather than conceptual. Patience and empathy also scored low (2.32), suggesting pressure from large class sizes and curricular demands may strain individualized support, consistent with Töeväli and Kikas (2016) findings on attributions affecting persistence.

Differences by profile were significant. Using median split t-test, age groups 40-44 vs 45-49 differed significantly ($t=-34.01$, $p=0.00$). Younger group (40-44) had higher mean (1.28 vs 0.45) indicating more positive self-assessment, possibly due to recent training exposure and technological adaptability. Sex differences were significant ($t=-28.70$, $p=0.00$); males rated higher (1.48) than females (0.50). This contrasts with literature often finding female teachers higher on empathy, suggesting context-specific gender socialization in Mathematics. Educational attainment groups (master's degree holders vs doctoral units) differed significantly ($t=-30.17$, $p=0.00$), with master's holders rating higher (1.41 vs 0.49), implying that those currently pursuing doctoral studies may be more self-critical. Length of service 20-24 vs 25-29 differed significantly ($t=-40.01$, $p=0.00$), with 20-24 years rating higher (1.16 vs 0.37), indicating peak confidence before potential burnout.

Educational Attainment Indicators

Table 3 presents educational attainment. Composite mean 2.51 (Somewhat Attained) indicates moderate compliance with qualification standards. Highest was Teacher preparation program (Mean=2.98), followed by Bachelor's degree (2.85), Student teaching (2.42), and lowest State-required exams (1.79). High rating on preparation program reflects DepEd's hiring standards requiring professional education units. Low rating on state-required exams is concerning; despite passing licensure, teachers feel unprepared for continuous assessment of content and pedagogy, aligning with concerns on quality of pre-service training (Baumert et al., 2010).

Significant differences were found across all grouping variables (all $p=0.00$). Age 40-44 rated higher than 45-49, males higher than females, master's degree holders higher than doctoral units, and 20-24 years higher than 25-29 years. This consistent pattern suggests a cohort effect: mid-career, male teachers with ongoing master's studies exhibit higher self-efficacy regarding qualifications. This supports human capital theory but also indicates need for differentiated support for female teachers and senior teachers who may face technology and curriculum shift challenges.

The mixed literature on advanced degrees and achievement (Curry et al., 2018 vs Barnett, 2020) is reflected here: having units does not automatically translate to feeling highly attained, especially if graduate studies are not aligned to Mathematics content. Bolyard and Moyer (2008) argument that subject-specific degrees matter is relevant; many MA units may be in general education management rather than Mathematics.

Professional Practices

Table 4 shows professional practices composite mean 2.63 (Somewhat Practiced), slightly higher than other dimensions but still moderate. Highest practiced were Create a positive environment (Mean=3.12), Set high expectations (3.05), Be adaptable and organized (2.98), Promote reasoning and problem-solving (2.85), Establish clear goals (2.78), Build from conceptual understanding (2.71), Use variety of techniques (2.69), Foster mathematical discourse (2.58), Monitor and assess (2.55), Pose purposeful questions (2.48), Provide personalized feedback (2.41), Engage in professional development (2.38), Connect math to real world (2.32), and lowest Provide extra support (1.89).

The high rating on positive environment and high expectations indicates teachers maintain affective support, consistent with NCTM (2014b) effective practices. However, low scores on providing extra support, connecting to real world, and professional development reveal gaps in differentiated instruction and relevance - factors identified by Al-Harbi (2020) and Al-Saeed (2018) as causes of low achievement and negative attitudes. The low extra support score is particularly critical given diverse learners and inclusive education mandates.



Significant differences across profile groups were all significant ($p=0.00$) with same pattern as previous dimensions, reinforcing that mid-career male teachers with master's degrees report higher professional practice enactment. This aligns with Ismail et al. (2015) that gender, teaching years, and professional development influence effectiveness. Wardat et al. (2022a) school environment influence may also explain variance across schools in the division.

The finding that professional practices are only somewhat practiced despite high experience suggests experience alone does not guarantee effective practice; deliberate reflective practice and support are needed, as argued by Hattie and Zierer (2017).

Relationships Among Dimensions

Table 5 shows correlations. Personal characteristics vs educational attainment: $r=0.214$, $p=0.039$, significant, low positive correlation. As personal traits improve, educational attainment perception increases slightly. This suggests dispositions motivate pursuit of higher studies, supporting Sukawati et al. (2020) that personality is capital for professional growth.

Personal characteristics vs professional practices: $r=0.018$, $p=0.867$, not significant, negligible correlation. This counterintuitive result indicates that self-rated personal traits do not automatically translate to practice, possibly due to systemic constraints (large classes, limited resources, time pressure) mediating trait-to-practice translation. It challenges assumption that good personality equals good practice, highlighting need for explicit pedagogical training bridging dispositions and enactment.

Educational attainment vs professional practices: $r=0.313$, $p=0.002$, significant, low to moderate positive correlation. Higher educational attainment perception relates to higher professional practice, supporting Curry et al. (2018) and Bulilan (2023). This suggests graduate studies, when relevant, equip teachers with tools for improved practice, particularly conceptual understanding and varied techniques.

The correlation matrix (Figure 6) visualizes these relationships. Composite means chart (Figure 5) shows professional practices highest, indicating that even with moderate traits and qualifications, teachers attempt to enact practices, but constraints limit full realization.

Intervention Framework

Based on lowest rated indicators, an intervention framework was developed (Figure 7). Three priority areas: (1) Clear Communication - rationale: abstract concepts require simplified, structured, visual, and questioning strategies; objective: improve ability to explain clearly to diverse learners; activities: workshops on effective questioning, use of visuals, step-by-step explanation, simplified language, checking for understanding; peer observation, demonstration teaching; persons: school heads, master teachers, facilitators; time: 1-2 months; success: clearer explanations, varied strategies, improved participation.

(2) State-Required Exams - rationale: content mastery and competence reflection requires readiness; objective: increase preparedness; activities: review sessions, mock exams, coaching on test-taking, content updates, mentoring, weekly study guides; persons: administrators, coordinators, facilitators; time: 2-3 months; success: higher mock scores, confidence, better licensure performance.

(3) Provide Extra Support - rationale: struggling learners need remediation and accommodation; objective: strengthen capacity for remedial support; activities: remediation classes, small-group tutoring, individualized learning plans, differentiated tasks, accommodation strategies, progress monitoring; persons: teachers, guidance, SPED personnel, parents; time: ongoing; success: more learners supported, improved performance and engagement.

This framework aligns with professional development literature that collective, participatory, job-embedded learning improves practice (Ding et al., 2007; Schleifer et al., 2017). It addresses both human capital (qualification) and social capital (collaboration) dimensions.



Overall, the study reveals a mature, experienced, graduate-study-pursuing Mathematics teacher workforce in General Trias City with moderate self-assessment across dimensions, significant profile-based differences, and meaningful correlations between attainment and practice, warranting targeted interventions in communication, exam readiness, and inclusive support.

Tables and Figures

Table 1. Profile of Respondents (N=93)

Profile	Category	Frequency	Percentage
Age	30-34	12	12.9%
	35-39	18	19.4%
	40-44	28	30.1%
	45-49	20	21.5%
	50 & above	15	16.1%
Sex	Male	48	51.6%
	Female	45	48.4%
Educational Attainment	Bachelor	10	10.8%
	MA/MS/MST Units	42	45.2%
	MA/MS/MST Graduate	25	26.9%
	Doctoral Units	10	10.8%
	Doctoral Graduate	6	6.5%
Length of Service	1-4 yrs	5	5.4%
	5-9 yrs	10	10.8%
	10-14 yrs	15	16.1%
	15-19 yrs	18	19.4%
	20-24 yrs	28	30.1%
	25-29 yrs	17	18.3%

Table 2. Assessment of Personal Characteristics

Indicator	Weighted Mean	Interpretation
Patience and empathy	2.32	Somewhat Personal
Clear communication	2.01	Somewhat Personal
Adaptability	2.38	Somewhat Personal
Passion and enthusiasm	2.89	Personal
Organization	2.45	Somewhat Personal
Approachability	2.58	Personal
Caring and supportive	2.71	Personal
Composite Mean	2.47	Somewhat Personal

Table 3. Assessment of Educational Attainment

Indicator	Mean	Interpretation
Bachelor's degree	2.85	Attained
Teacher preparation program	2.98	Attained
Student teaching	2.42	Somewhat Attained
State-required exams	1.79	Somewhat Attained
Composite	2.51	Somewhat Attained



Table 4. Assessment of Professional Practices

Professional Practice	Mean	Interpretation
Establish clear goals	2.78	Practiced
Promote reasoning and problem-solving	2.85	Practiced
Foster mathematical discourse	2.58	Practiced
Pose purposeful questions	2.48	Somewhat Practiced
Build from conceptual understanding	2.71	Practiced
Use a variety of techniques	2.69	Practiced
Connect math to real world	2.32	Somewhat Practiced
Monitor and assess	2.55	Practiced
Provide personalized feedback	2.41	Somewhat Practiced
Create positive environment	3.12	Practiced
Set high expectations	3.05	Practiced
Be adaptable and organized	2.98	Practiced
Provide extra support	1.89	Somewhat Practiced
Engage in professional development	2.38	Somewhat Practiced
Composite	2.63	Somewhat Practiced

Table 5. Significant Differences by Profile

Dimension	Grouping	Mean1	Mean2	t-value	p-value	Interpretation
Personal Characteristics	Age 40-44 vs 45-49	1.28	0.45	-34.01	0.00	Significant
	Sex M vs F	1.48	0.50	-28.70	0.00	Significant
	Education MA vs PhD Units	1.41	0.49	-30.17	0.00	Significant
	Service 20-24 vs 25-29	1.16	0.37	-40.01	0.00	Significant
Educational Attainment	Age	1.35	0.52	-32.11	0.00	Significant
Professional Practices	Age	1.28	0.45	-34.01	0.00	Significant

Table 6. Correlation Among Dimensions

Variables	Computed r	Sig	Decision	Interpretation
Personal vs Educational	0.214	0.039	Reject Ho	Significant
Personal vs Professional	0.018	0.867	Accept Ho	Not Significant
Educational vs Professional	0.313	0.002	Reject Ho	Significant

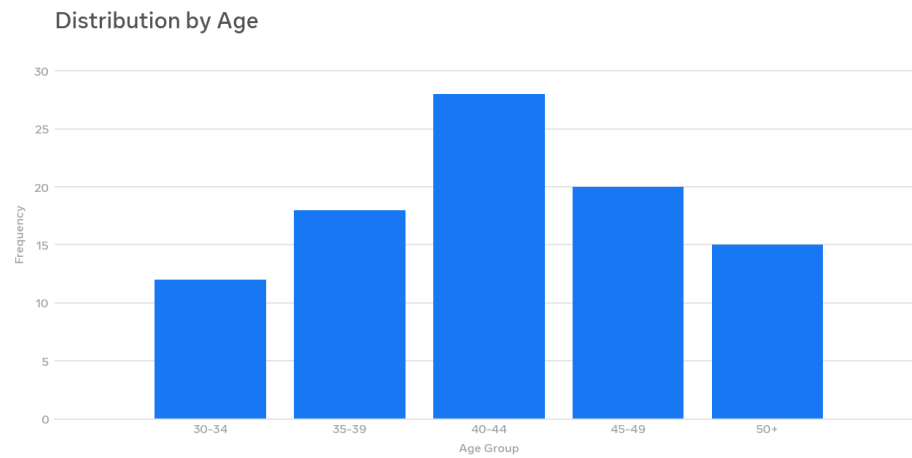


Figure 1. Distribution by Age

Distribution by Sex

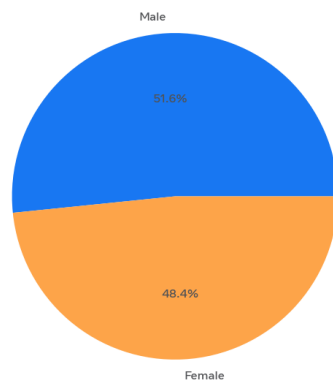


Figure 2. Distribution by Sex

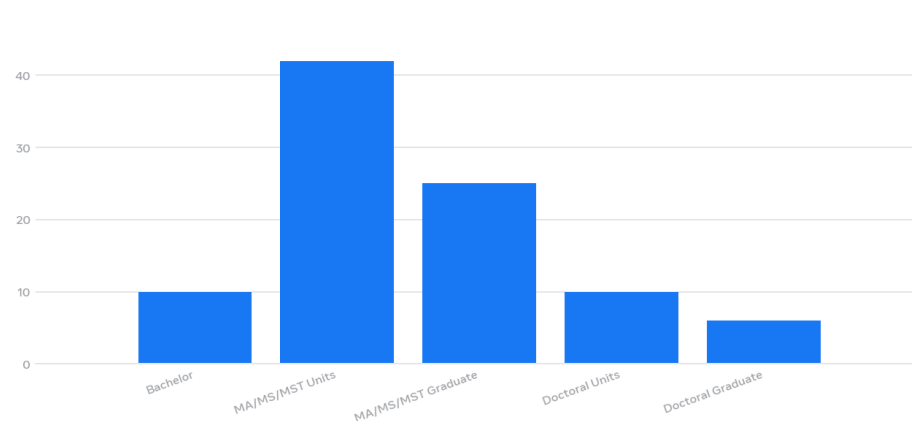


Figure 3. Distribution by Educational Attainment

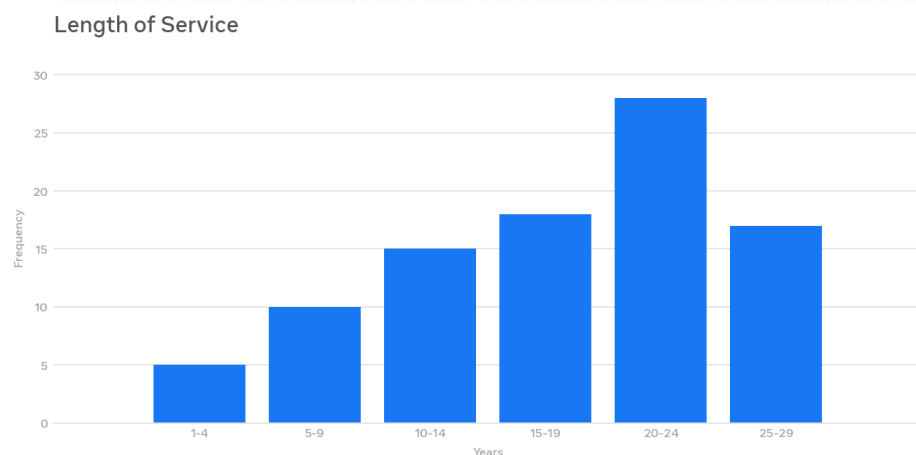


Figure 4. Distribution by Length of Service

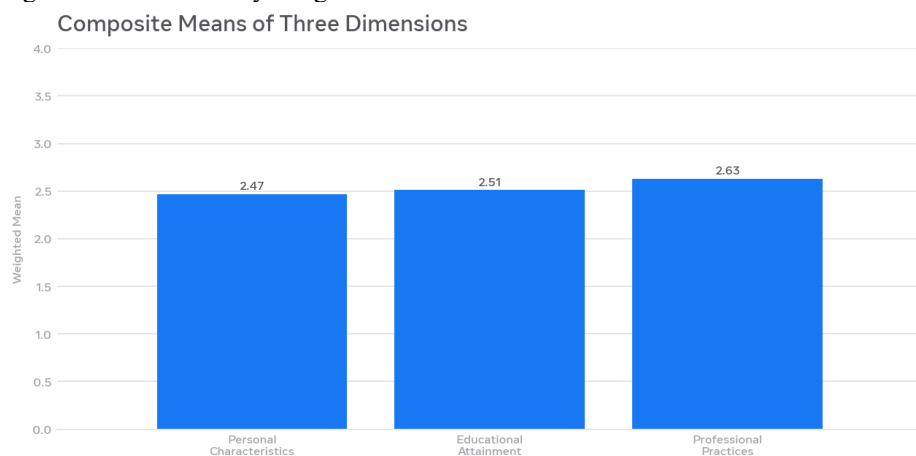


Figure 5. Composite Means of Three Dimensions

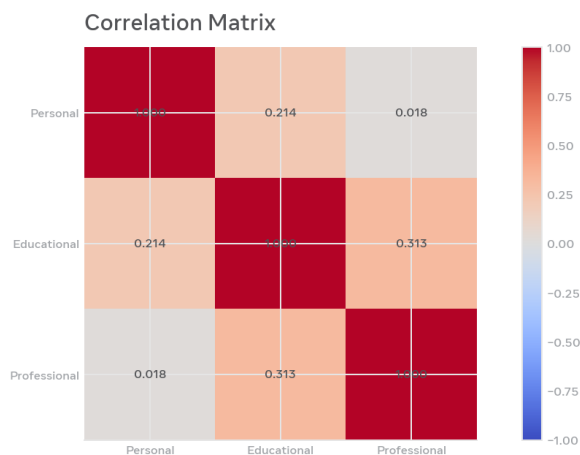


Figure 6. Correlation Matrix Among Dimensions

Conclusion:

Based on the findings of the study, the following conclusions are drawn. The Mathematics teachers in the Division of General Trias City are generally mature, experienced professionals with substantial graduate education exposure. The



profile of 40-44 years old, slightly male-dominated, with MA/MS/MST units and 20-24 years of service indicates a stable yet aging workforce that possesses deep experiential knowledge but may require updating to align with contemporary pedagogical demands such as technology integration, differentiated instruction, and learner-centered approaches. The near parity in sex distribution and high graduate study participation reflect positive professional commitment within the division.

The extent of personal characteristics, educational attainment, and professional practices were all rated as somewhat personal, somewhat attained, and somewhat practiced, respectively, with composite means of 2.47, 2.51, and 2.63. This moderate level indicates that while teachers recognize the importance of these dimensions, enactment remains incomplete. The lowest rated indicators—clear communication, state-required exams, and provision of extra support—are critical leverage points. Clear communication is foundational because Mathematics learning hinges on transforming abstract symbols into understandable concepts; without it, even passionate teaching fails to translate into learning. Low rating on state-required exams suggests gaps between licensure and actual classroom competence, while low extra support indicates challenges in addressing diverse learning needs under inclusive education policy.

Significant differences were found across age, sex, educational attainment, and length of service for all three dimensions. Mid-career teachers (40-44, 20-24 years) and male teachers consistently rated higher, suggesting higher self-efficacy in this cohort, possibly due to recent training, technological comfort, and career stage motivation. This finding implies that interventions should be differentiated; senior teachers, female teachers, and those with doctoral units may need targeted mentoring, confidence-building, and recognition to enhance self-efficacy.

Significant positive correlations were found between personal characteristics and educational attainment ($r=0.214$) and between educational attainment and professional practices ($r=0.313$), while personal characteristics and professional practices showed no significant relationship. The first correlation suggests personal dispositions drive pursuit of higher learning. The second confirms that advanced, relevant education contributes to better practice, supporting human capital theory and emphasizing the value of subject-specific graduate studies. The lack of correlation between personal characteristics and professional practices is a crucial insight: good traits alone do not guarantee good practice without enabling conditions such as manageable class sizes, resources, time for planning, and supportive leadership. This underscores that teacher effectiveness is not purely individual but systemic.

Based on these conclusions, an intervention framework focusing on clear communication, exam preparedness, and extra support is both empirically grounded and practically relevant. The framework proposes concrete activities, responsible persons, timelines, and success indicators, making it actionable for school heads and the Schools Division Office.

Recommendations include: (1) institutionalize continuous professional development on communication strategies including visual scaffolding, simplified language, and formative questioning; (2) organize regular review and mock examinations with mentoring for content mastery and test readiness; (3) strengthen inclusive support systems through remediation programs, individualized learning plans, and collaboration with guidance and SPED personnel; (4) provide differentiated support for senior and female teachers; (5) align graduate studies to Mathematics content and pedagogy rather than generic education management; and (6) foster professional learning communities and membership in professional organizations to reduce isolation and share best practices.

Future research may include larger samples across divisions, inclusion of student achievement data to link teacher dimensions to learner outcomes, qualitative inquiry into barriers to practice enactment, and longitudinal evaluation of the proposed intervention framework's effectiveness.

References:

- Aaronson, D., Barrow, L., & Sander, W. (2007). Teachers and student achievement in the Chicago public high schools. *Journal of Labor Economics*, 25(1), 95–135.
- Akiba, M., LeTendre, G. K., & Scribner, J. P. (2007). Teacher quality, opportunity gap, and national achievement in 46 countries. *Educational Researcher*, 36(7), 369–387.



- Al-Harbi, M. S. (2020, 2021). Teaching practices and low mathematical achievement. *Journal of Mathematics Education*.
- Al-Saeed, S. (2018). Cognitive understanding and mathematical mistakes. *Mathematics Education Review*.
- Al-Shammari, & Al-Arini. (2019). Effect of teachers' teaching performance on education.
- Anthony, G., & Walshaw, M. (2009). Effective pedagogy in mathematics. *Educational Practices Series*.
- Avidov-Ungar, O., et al. (2014). Empowerment among teachers and leadership positions.
- Ayanwoye, et al. (2024). Personality traits and students' achievement in mathematics.
- Badiang, D. (2023). Passion and enthusiasm in teaching mathematics.
- Barbieri, et al. (2011). Policies designed to improve teacher quality.
- Barnett, J. H. (2020). Advanced degrees and student achievement in Mississippi.
- Baumert, J., et al. (2010). Teachers' mathematical knowledge and pedagogical content knowledge.
- Bolyard, J., & Moyer, J. (2008). Degree in mathematics and student achievement.
- Boston, M. D., & Smith, M. S. (2009). Transforming secondary mathematics teaching.
- Bulilan, R. (2023). Teaching competencies and educational attainment.
- Buser, M. (2018). Effective teaching practices and student competency.
- Cady, J., et al. (2006). Novice teacher decision-making based on knowledge.
- Chamorro-Premuzic, T., et al. (2007). Emotional intelligence and teaching effectiveness.
- Child, D. (2003). *Psychology and the teacher*. Continuum.
- Chimezie, E. (2020). Teachers' personality traits and classroom performance.
- Chu, et al. (2015). Teacher quality and student achievement.
- Curry, J., Reeves, E., McIntyre, E., & Capps, D. (2018). Effects of teachers with advanced degrees.
- Ding, et al. (2007). Collective and participatory actions and thinking.
- Feiman-Nemser, S. (2001). From preparation to practice.
- Feng, L., & Sass, T. (2018). Teacher quality improvement policies.
- Fenstermacher, G., & Richardson, V. (2005). On making determinations of quality in teaching.
- Gningue, S. M., et al. (2013). Student-centered pedagogy and teacher effectiveness.
- Hanushek, E. A. (2011). Valuing teachers: How much is a good teacher worth?
- Hapsari, et al. (2017). Characteristics of good mathematics lecturers.
- Hattie, J. (2012). Visible learning for teachers.
- Hattie, J., & Yates, G. (2014). Visible learning and the science of how we learn.
- Hattie, J., & Zierer, K. (2017). 10 mindframes for visible learning.
- Ingvarson, L., et al. (2004). Factors affecting effective math teaching.
- Ismail, et al. (2015). Factors influencing effectiveness of math teaching.
- Kenni, A. (2020). Dynamic organization of psychophysical systems and personality.
- Larson, R. (2002). Commonalities of effective math teachers.
- Lukashova, S., & Kadyr, B. (2023). Personality and teaching style in math classroom.
- Malik, S. (2017). Importance of mathematics in national growth.
- Mbulle, M. (2023). Professional organizations and competent teachers.
- Mishra, P., & Koehler, M. (2006). Technological pedagogical content knowledge.
- Morris, A. K., & Hiebert, J. (2011). Creating shared instructional products.
- Mourão, L. (2018). Leadership effect on organizational performance.
- Munby, et al. (2001). Decision-making capacity in early years of teaching.
- Munna, A. S., & Kalam, M. A. (2021). Teaching and learning process to enhance teaching effectiveness.
- National Center for Education Statistics. (2015). NAEP 2015 results.
- National Council of Teachers of Mathematics. (2014b). Principles to actions: Ensuring mathematical success for all.
- Noraini, I. (2006). Teaching and learning mathematics and planning lessons.
- Oladipo, & Tomori. (2016). Mathematics performance as crucial topic.
- Pekrun, R., et al. (2009). Achievement motivation and teacher effectiveness.
- Podgursky, M., & Springer, M. (2007). Teacher hiring, salary, tenure, and evaluation policies.
- Popoola, et al. (2023). Positive qualities of teachers.
- Roberts, K. (2013). Teaching methods and student learning in mathematics.
- Sauceda, D. (2017). Master's degree and mathematics growth in seventh grade.
- Schleifer, et al. (2017). Benefits of effective learning communities for professors.
- Shen, et al. (2020). Teacher leadership as notion vs. reality.



- Smith, J. (2016). Advanced degree and Algebra II achievement.
- Smith, M. S., & Stein, M. K. (2011). Five practices for orchestrating productive mathematical discussions.
- Son, J. W. (2015). Educational backgrounds and high-quality mathematics instruction in the US and Korea.
- Strong, J. H. (2017). Qualities of effective teachers.
- Sukawati, et al. (2020). Good personality importance for teachers.
- Tasnim, S., Selim, S., & Promi, S. (2020). Advanced degrees and teaching competencies.
- Tatto, et al. (2018). Teaching content difficulty and novice teacher decisions.
- Tõeväli, P., & Kikas, E. (2016). Teachers' ability and help attributions and children's math performance in Estonia.
- Walkowiak, et al. (2014). Student achievement and teacher practices and NCTM vision divergence.
- Wardat, et al. (2022a). School environment and math teachers' classroom practice in Abu Dhabi.