

Assessment on the Effectiveness of Public Mathematics Curriculum on Students' Achievement and Attitude Towards A Curriculum Implementation Approach

Junyi Li¹, Serena Corbeta-Gomez^{2*}

¹Graduate School of Education, College of Arts, Sciences and Education, Trinity University of Asia, Cathedral Heights, 275 E. Rodriguez Sr. Avenue, Quezon City, Philippines, 1103 Manila

^{2*}Doctor, Graduate School of Education, College of Arts, Sciences and Education, Trinity University of Asia, Cathedral Heights, 275 E. Rodriguez Sr. Avenue, Quezon City, Philippines, 1103 Manila

Authors' Emails: junyinli@tua.edu.ph¹, scgomez@tua.edu.ph^{2*}

ORCID : [junyili805@outlook.com](https://orcid.org/0009-0000-0861-3598)¹ , 0009-0000-0861-3598^{2*}

Article History:

Received: 10-01-2025

Revised: 27-02-2025

Accepted: 07-03-2025

Abstract: This study primarily gauges the effectiveness of the public mathematical curriculum in shaping students' achievement and attitude toward the implementation of the curriculum. To effectively conduct a study, a descriptive quantitative research design was assumed, whereby data were acquired from grade 12 students and mathematics teachers of grade 12 through surveys, structured questionnaires, and academic performance records. These findings reveal mixed perceptions about effectiveness, whereby students and teachers are uncertain as to whether the curriculum effectively responds to individual learning needs, inspires learning engagement, or enables conceptual understanding. Inferential statistics also indicated that there is no statistical difference between teachers' and students' perceptions on the whole regarding curriculum effectiveness, and for the high perceived effectiveness that did not relate well to students' achievements for engagement and individual needs save for conceptual understanding. This would involve specific participatory changes in the curriculum, inclusive of adaptive learning strategies and depth in conceptual aspects, thereby contributing to the larger discourses on equity in education, development of curriculum, and how best the evidence-based approaches can support mathematics education.

Keywords: Public mathematical, Curriculum, Students' achievement, Evidence-based approaches

Introduction

The subject of mathematics education holds paramount importance within the educational system since decades ago. Students need to master mathematics because these skills develop their ability to solve problems and think critically. These competencies will assist students to reach their goals both inside and outside the classroom. Students possess distinctive learning designs together with variable capabilities as well as personal study methods. Different teaching approaches should be applied because they serve to adapt instruction toward students' requirements which produces optimal learning outcomes. The significance of mathematics education in society has led to the proposal of a public mathematic curriculum as a means to offer top-quality mathematical training for every person.

Public Mathematics has a curriculum that provides a thorough, standardized mathematics training system that provides all students with the same school opportunities, regardless of their social status, educational resources, or geographical housing. The program argues that mathematics should outperform educational institutions to achieve a larger audience for sustainable learning from numerical skills. The main purpose of public mathematical formation is the development of mathematical skills in all population segments. The curriculum aims to develop important mathematical skills, leading to improved critical thinking and problem-solving skills in real-world

scenarios and know-how in key mathematical applications. The curriculum provides these skills to individuals and allows participants to rely on decisions about mathematical evidence.

Through the public mathematics curriculum, the government recognizes that public participation in mathematics education is still present. The curriculum promotes teamwork between educators and political decision-making. This promotes community organizations as well as community organizations to create and use successful mathematical learning experiences. Collaborative Strategy is actively working to build collective responsibility for mathematical training that determines the environment that supports learning for all. The public mathematics curriculum engages in creating integrated education models by understanding different approaches for learning and cultural backgrounds and personal preferences. The curriculum uses modern educational strategies that combine problem-based learning and searching with technical equipment to build student benefits and at the same time improve understanding of mathematics.

Students belong to multiple different population groups with unique abilities and weaknesses alongside individual ways of learning. The public mathematics curriculum adopts student diversity as a factor to create customized educational frameworks for each learner. Studies on public mathematics education curriculum effectiveness guide teachers to discover optimal teaching strategies that serve all students equitably. Public mathematics curriculum affects educational policies at every level through its outcome success. Government officials can establish dependable choices for standards and training methods and resource management decisions by using evaluation research as a basis. The technique supports the development of an encouraging policy framework which ensures successful math learning for every student. Evidence-based approaches in policymaking enable authorities to develop educational policies which align with delivering superior math education to every learner.

Scope and Delimitation

This research study aims to evaluate the effectiveness of public mathematics curriculum by investigating its influence on students' academic performance and their overall attitude towards the curriculum implementation approach. The study will include students who are at least 18 years old and enrolled in grade 12. This age and grade level were selected to ensure participants have a sufficient background in mathematics education to provide valuable insights. The minimum required sample size for teacher participants will be set at 30. These teachers will be selected from the participating schools. The study intends to collect data primarily from the students' point of view, utilizing surveys, questionnaires, interviews, and academic performance records. Additionally, it may involve comparing school participants, teachers and students' perspective to the public mathematics curriculum with their demographic profile to gain a comprehensive understanding of how the curriculum performs in various public educational settings. The ultimate objective is to offer valuable insights into the curriculum's efficacy in public schools.

Research Methodology

This chapter presents the design and methodology of the study. Specifically, it presents the following in details: the research design, the population, sample, and sampling technique used; the research instruments, data gathering procedure, and the statistical tools in analyzing the data.

Research Design

This research design will involve collecting numerical data to measure and analyze the variables of interest, such as student attitudes, teacher challenges, and student achievement in mathematics. It uses structured questionnaires to gather data from students and teachers, focusing on their attitudes, perceptions, and experiences related to public curriculum in mathematics. The questionnaires includes Likert scale items, multiple-choice questions, and open-ended questions. The research would administer standardized mathematics tests or develop my own assessment tools to measure student achievement in mathematics towards public mathematics curriculum.

Population, Sample, and sampling procedures

The Sample

The study intends to focus on a specific grade level or range of grade levels, such as senior high school students above 18 years old. It will be targeting students in a particular school setting, such as public schools, private

schools, or specific types of schools (e.g., urban, suburban, rural). The population based on specific characteristics or contexts, such as students from diverse backgrounds, students with learning disabilities, or students in a specific geographical region.

Sampling Techniques

An appropriate focus will be placed on age adequacy by making certain all selected respondents for the sample are from grade 12 and older than 18 years. The goal is to compose a representative sample of grade12 students while concentrating primarily on those who are 18 or older. This approach was taken in order to ensure that participants are not only mature, but also that representation is captured from different socio-economic and academic achievement levels. Mathematics teachers were chosen from the available of holders of a qualification or teaching experience in public mathematics curriculum and those currently applying it in their teaching. The aim is to obtain at least 30 teachers for the sample.

.Inclusion Criteria for participants

- Students:

- i.Students who are above 18 years old

- ii.Public mathematics curriculum enrollment

- iii.Consent to participate

- Teachers:

- i.Teaching experience in mathematics

- ii.Exposure to public mathematics curriculum training or implementation

- iii.Consent to participate

- Exclusion Criteria for participants

- Students:

- i.Students with severe learning disabilities that significantly affect their ability to engage in mathematics instruction.

- ii.Students who do not provide consent to participate

- iii.Students who are under 18 years old

- Teachers:

- i.Teachers who have no experience or knowledge of public mathematics curriculum.

- ii.Teachers who do not provide consent to participate

Data Gathering Procedure

1. Select the suitable research design that matches the research objectives. Authors selected descriptive quantitative design as the research design for this project. The researcher must decide what type of necessary data confirms the research questions to choose the right research method.

2. I will apply for ethical approval from my institution if necessary for conducting my study. Our data collection methods need to follow both ethical rules and maintain complete participant privacy.

3. Identify the specific group of participants who will receive focus in my research. A defined population for this research would consist of students from particular grade levels and institutions that operated under the public mathematics curriculum. Set criteria describing the identities of participants who will be studied for my research project.

4. Give priority to select a proper sample size coupled with an appropriate sampling method: Base our study on statistical power standards and population representational values. We need to select the sampling technique which matches my research plan from random sampling and stratified sampling and purposive sampling.

5. Pick suitable measurement tools which will acquire information regarding student achievements alongside their opinions about the curriculum implementation method. The available data collection instruments consist of achievement tests alongside questionnaires, surveys and observation protocols and interviews. The selected research instruments need to demonstrate reliability and validity for application in my research design.

6. We will execute the procedures designed to obtain data. Achievement tests for mathematical performance assessment and distributed questionnaires or surveys aim to collect data about students' attitudes regarding the curriculum implementation approach.

7. We will use correct statistical and qualitative analysis methods to process the gathered data. Analyses of quantitative findings happen by means of statistical software applications but qualitative data needs either thematic analysis or content analysis methods. The results must be analyzed according to my research questions together with my objectives.

8. We will interpret the results from my data analysis before drawing conclusions with supporting evidence from the research findings. I should organize all research methodological information alongside results together with my final conclusions into an easily understandable research report or manuscript format. My research findings should be spread through academic publications or scientific conferences to advance knowledge in mathematics education.

Ethical Considerations:

Ethical considerations are of utmost importance as they guide our behaviors, decisions, and interactions with others. They promote human dignity, fairness, cooperation, and social cohesion. By incorporating ethical principles into various aspects of life, we can contribute to a more just, compassionate, and sustainable world. In this research, the researcher needs to follow:

- Obtain informed consent from participants, ensuring they understand the purpose, procedures, and potential risks and benefits of the study.
- Ensure confidentiality and anonymity of participants' responses and data.
- Comply with relevant ethical guidelines and regulations regarding research involving human subjects.

Results and Discussion:

1. What is the perceived effectiveness of public curriculum in mathematics as assessed by teachers and students in terms of:

Table 1.1

Mean Score and Descriptive Interpretation on the Perceived Effectiveness of Public Curriculum in Mathematics as assessed by Teachers and Students in terms of Addressing individual learning needs

Statements	Respondent Type	Mean	SD
1. effectively addresses the individual learning needs of students.	Student	3.35 (Uncertain)	1.44

Statements	Respondent Type	Mean	SD
	Teacher	3.28 (Uncertain)	1.55
2. provides appropriate resources and support to meet the diverse learning needs of students.	Student	3.46 (Agree)	1.40
	Teacher	3.47 (Agree)	1.37
3. Offers instruction that accommodates various learning styles and abilities.	Student	3.29 (Uncertain)	1.23
	Teacher	3.16 (Uncertain)	1.27
Overall Rating	Student	3.36 (Uncertain)	1.36
	Teacher	3.30 (Uncertain)	1.40

Legend: 1.00-1.80 (SD); 1.81-2.60(D); 2.61-3.40(U);3.41-4.20(A); 4.21-5.00(SA)

Both teachers and students perceive the public mathematics curriculum as having limited effectiveness in addressing individual learning needs. For the statement of effectively addresses the individual learning needs of students, both students (mean = 3.35) and teachers (mean = 3.28) rated this item as "Uncertain." This alignment suggests that both groups feel the curriculum does not strongly meet the individual learning needs of students. The similar scores indicate that neither teachers nor students are fully confident in the curriculum's ability to provide individualized learning support. For the statement of provides appropriate resources and support to meet the diverse learning needs of students, both students (mean = 3.46) and teachers (mean = 3.47) agree with this statement, as indicated by the "Agree" rating.. The work of Christodoulou and Angeli (2022), on adaptive learning technologies, directly supports such an inquiry. For instance, it enlightens how adaptive learning environments support instructional effectiveness by giving ability to content that could be tailored towards individual learner needs, thereby improving engagement and outcomes-a mirror of what this study seeks to assess about the curriculum's ability to satisfy diverse learning needs.

Table 1.2 Mean Score and Descriptive Interpretation on the Perceived Effectiveness of Public Curriculum in Mathematics as assessed by Teachers and Students in terms of *Engaging students' interests and motivation*

Statements	Respondent Type	Mean	SD
1. includes activities that capture students' interest in mathematics.	Student	3.25 (Uncertain)	1.37
	Teacher	3.22 (Uncertain)	1.41
2. motivates students to actively participate and engage in mathematical learning.	Student	3.28 (Uncertain)	1.20
	Teacher	3.25 (Uncertain)	1.22
3. integrates real-life examples and applications to enhance student motivation.	Student	3.27 (Uncertain)	1.26
	Teacher	3.16 (Uncertain)	1.22
Overall Rating	Student	3.27 (Uncertain)	1.28
	Teacher	3.21 (Uncertain)	1.28

Legend: 1.00-1.80 (SD); 1.81-2.60(D); 2.61-3.40(U);3.41-4.20(A); 4.21-5.00(SA)

Both teachers and students perceive the public mathematics curriculum as having limited of engaging students' interests and motivation. For the statement of including activities that capture students' interest in mathematics, both students (mean = 3.25) and teachers (mean = 3.22) rated this item as "Uncertain," indicating that neither group finds the curriculum particularly effective in making mathematics engaging through interesting activities. The similar scores imply that both groups perceive a gap in this area. For the statement of motivating students to actively participate and engage in mathematical learning, students (mean = 3.28) and teachers (mean = 3.25) again rated this aspect as "Uncertain. This suggests a shared perception that the curriculum is only moderately effective at best in relating mathematical concepts to real-world contexts that could motivate students. This is evident from the mean scores for all statements, which fall within the "Uncertain" category. This supports the findings of research that the extent to which learning content can engage the interest of students shall determine how their experiences and motivation toward learning or else will be brought about (Karunakaran, 2020). Engagement and motivation are very significant because they may also directly implicate students' conceptions of attitude toward mathematics learning and possibly performance (Karunakaran, 2020).

Table 1.3 Mean Score and Descriptive Interpretation on the Perceived Effectiveness of Public Curriculum in Mathematics as assessed by Teachers and Students in terms of *Promoting conceptual understanding*

Statements	Respondent Type	Mean	SD
1. emphasizes understanding mathematical concepts rather than rote memorization.	Student	3.38 (Uncertain)	1.41
	Teacher	3.31 (Uncertain)	1.49
2. provides opportunities for students to explore mathematical concepts through hands-on activities.	Student	3.16 (Uncertain)	1.17
	Teacher	3.03 (Uncertain)	1.23
3. encourages critical thinking and problem-solving skills to develop conceptual understanding.	Student	3.12 (Uncertain)	1.24
	Teacher	3.13 (Uncertain)	1.34
Overall Rating	Student	3.22 (Uncertain)	1.27
	Teacher	3.16 (Uncertain)	1.35

Legend: 1.00-1.80 (SD); 1.81-2.60(D); 2.61-3.40(U);3.41-4.20(A); 4.21-5.00(SA)

Both teachers and students perceive the public mathematics curriculum as having limited of promoting conceptual understanding.

For the statement of emphasizing understanding of mathematical concepts rather than rote memorization, Students rated this item with a mean of 3.38, while teachers rated it at 3.31, both within the "Uncertain" category. This suggests that neither group is fully convinced that the curriculum prioritizes conceptual understanding over memorization. The close mean scores imply a consensus that the curriculum's approach could benefit from a stronger focus on concept-driven learning. For the statement of providing opportunities to explore concepts through hands-on activities, Both students (mean = 3.16) and teachers (mean = 3.03) rated this item as "Uncertain." This alignment indicates that both groups feel the curriculum may not offer sufficient opportunities for interactive, experiential learning, which could otherwise deepen students' grasp of mathematical concepts. For the statement of encouraging critical thinking and problem-solving to develop conceptual understanding, Students (mean = 3.12) and teachers (mean = 3.13) also rated this item as "Uncertain," indicating a shared perception that the curriculum

lacks strong elements to promote critical thinking and problem-solving skills. This perception underscores a potential gap in the curriculum's support for developing higher-order cognitive skills. This is evident from the mean scores for all statements, which fall within the "Uncertain" category. This suggests that neither teachers nor students believe the curriculum is strongly effective in promoting conceptual understanding.

Table 1.4 Mean Score and Descriptive Interpretation on the Perceived Effectiveness of Public Curriculum in Mathematics as assessed by Teachers and Students in terms of **Supporting diverse learners**

Statements	Respondent Type	Mean	SD
1. considers the needs of diverse learners, including students with disabilities and English language learners.	Student	3.21 (Uncertain)	1.37
	Teacher	3.09 (Uncertain)	1.44
2. offers appropriate accommodations and modifications to support diverse learners in mathematics.	Student	3.29 (Uncertain)	1.32
	Teacher	3.31 (Uncertain)	1.40
3. promotes inclusive practices that create a positive learning environment for all students.	Student	3.18 (Uncertain)	1.39
	Teacher	3.28 (Uncertain)	1.49
Overall Rating	Student	3.23 (Uncertain)	1.36
	Teacher	3.23 (Uncertain)	1.44

Legend: 1.00-1.80 (SD); 1.81-2.60(D); 2.61-3.40(U);3.41-4.20(A); 4.21-5.00(SA)

For the statement of emphasizing understanding of considering the needs of diverse learners, including students with disabilities and English language learners, students rated this item with a mean of 3.21, and teachers rated it slightly lower at 3.09, both falling within the "Uncertain" category. This alignment implies that both groups feel the curriculum does not sufficiently address the diverse needs of all learners, including those who may require additional support. For the statement of offering appropriate accommodations and modifications, Students rated this item at 3.29 and teachers at 3.31, both "Uncertain." This suggests that both groups perceive the curriculum as somewhat lacking in providing tailored support and modifications for diverse learners. The close means indicate a shared viewpoint on this perceived gap. For the statement of promoting inclusive practices for a positive learning

environment, with students rating this at 3.18 and teachers at 3.28, both in the "Uncertain" category, there is a consensus that the curriculum may not strongly foster inclusivity in the classroom. This perceived shortfall could impact the overall learning atmosphere and accessibility for all students. This is evident from the mean scores for all statements, which fall within the "Uncertain" category. This suggests that neither teachers nor students believe the curriculum is strongly effective in supporting diverse learners.

2. Is there a significant difference between the assessed level of effectiveness of public curriculum in mathematics as assessed by teachers and student respondents?

The second statement of the problem (SOP2) will address and test the null hypothesis (H_0), which posits that there is no significant relationship between the perceived effectiveness of the public mathematics curriculum as evaluated by teachers and students. SOP2 aims to determine whether this hypothesis holds true or if the alternative hypothesis (H_1) should be accepted, suggesting a significant relationship between these assessments.

A t-test will be conducted to examine the relationship between the assessed levels of effectiveness of the public mathematics curriculum as evaluated by teachers and students. The results of the t-test are presented in Table 2.

Table 2 Independent Samples T-Test

	Statistic	df	P – value (Decision)
Addressing Individual Learning needs	0.26945	45.5	0.789 (Not Sig. at 5%)
Encouraging Collaborative Learning	0.09165	47.5	0.927 (Not Sig. at 5%)
Engaging Students' Interests and Motivation	0.29761	48.6	0.767 (Not Sig. at 5%)
Promoting Conceptual Understanding	0.27547	45.6	0.784 (Not Sig. at 5%)
Supporting Diverse Learners	-0.00564	42.9	0.996 (Not Sig. at 5%)
Catering to Various Readiness Levels	0.46145	44.5	0.647 (Not Sig. at 5%)

Note: Since $p > 0.05$, Not significant

There is no significant difference between the perceived effectiveness of the public mathematics curriculum as assessed by teachers and students. The independent samples t-test results indicate that the differences in ratings between teachers and students for all aspects of the curriculum are not statistically significant. This suggests that both groups hold similar views on the curriculum's effectiveness, despite potential differences in their perspectives and experiences.

3. What are the average Mathematics grades of the student- respondents whose teachers implement public mathematics curriculum?

The question will also enable us to find the average Mathematics grades of the student respondents whose teachers apply the public mathematics curriculum. Since a performance record is generally kept of students, the dependence of the curriculum on achievement thereby can be analytically worked out. The data collected will provide insight into overall grade trends and allow for a more in-depth evaluation of the curriculum's scope for fostering academic success. This will be an explanatory analysis through which the investigation tries to record the process by which the implementation of the curriculum influences student achievement in Mathematics.

Table 3 Result of average Mathematics grade of students

Student	Mean	SD
Grade	84.7	9.51

The implementation of the public mathematics curriculum may directly affect the performance of the students. A deeper understanding of how the curriculum really guarantees learning outcomes could be achieved by analyzing the average mathematics grades of student respondents whose teachers implement the public curriculum. According to de Vries et al. (2024), the foremost influence on student achievement was found to be teacher assessment methods, especially the combination of summative and formative approaches. Indeed, teachers who adopt diversified assessment methods in the forms of written exercises, oral assessments, and performance-based evaluations are more likely to give students opportunities for feedback and self-regulation that enhance learning outcomes. This supports the idea that it could be how teachers implement and judge the public curriculum that decides a leading determinant in the academic success of their students, as supported by their grades in mathematics. It's actually in these associations that meaningful deductions on the effectiveness of a curriculum in promoting student achievements can be reached.

4. Is there a significant relationship between the perceived effectiveness of public curriculum in mathematics to students' achievement in mathematics?

This question aims to explore whether a significant relationship exists between these variables, offering insights into the impact of curriculum effectiveness on academic outcomes. Specifically, this question will address and test the third null hypothesis (H₀₃).

Correlation matrix on the significant relationship between the perceived effectiveness of public curriculum in mathematics to students' achievement

Table 4

	Grade		
	Pearson's r	p-value	Decision
Addressing Individual Learning needs	0.179	0.051	Not Sig. at 5%
Engaging Students' Interests and Motivation	0.16	0.081	Not Sig. at 5%
Promoting Conceptual Understanding	0.2	0.028	Sig. at 5%
Supporting Diverse Learners	0.154	0.092	Not Sig. at 5%
Encouraging Collaborative Learning	0.149	0.105	Not Sig. at 5%
Catering to Various Readiness Levels	0.132	0.15	Not Sig. at 5%

There is a significant positive relationship between the perceived effectiveness of the public mathematics curriculum in promoting conceptual understanding and students' achievement in mathematics.

This suggests that when students perceive the curriculum as effective in promoting conceptual understanding, they tend to achieve higher grades in mathematics. This finding emphasizes the importance of focusing on developing a deep understanding of mathematical concepts to improve student achievement.

Walkington and Bernacki (2020) describe how conceptual learning may support improved student achievement and engagement by allowing specialized instruction on individual needs, interests, and learning styles. Indeed, their study aspects have it that in conceptual learning models, students take ownership of their education; therefore, students are 'extra' motivated, which leads to better academic performances. Such models make education relevant and meaningful by embedding students' personal interests into the process of learning and therefore raise the graph of learning outcomes. This approach is of great importance while dealing with the effectiveness of a curriculum because personalized pedagogies can answer a host of problems diverse learners experience, especially for those who cannot fit into obstacles present in the traditional methods of teaching. Indeed, the concept of learning through relevance of content to students' interests has been found to enhance performance and engagement in mathematics education. Indeed, it points toward personalized learning as a promising strategy in pursuit of improved curriculum

5. What is the level of attitude of the student respondents whose teachers implement public curriculum in mathematics?

Table 5 Mean Score and Descriptive Interpretation on the Level of Attitude of the student- respondents whose teachers implement public mathematics curriculum

Descriptives			
Statements	Mean	Interpretation	SD
1、 I believe that I am capable of understanding and solving mathematical problems.	3.17	Uncertain	1.31
2、 I think that I have a natural talent for mathematics.	3.32	Uncertain	1.44
3、 I think that I am better at mathematics than most of my peers.	3.26	Uncertain	1.41
4、 I feel confident when working on mathematics tasks.	3.24	Uncertain	1.51
5、 I believe in my ability to succeed in mathematics.	3.33	Uncertain	1.28
6、 I feel proud of my mathematical achievements and progress.	3.24	Uncertain	1.43
7、 I feel nervous or anxious when faced with a mathematics test	3.28	Uncertain	1.47
8、 I worry that I will make mistakes or fail in mathematics.	3.26	Uncertain	1.36
9、 I find mathematics interesting and enjoyable.	3.27	Uncertain	1.39
10、 I look forward to learning new mathematical concepts and solving problems.	3.32	Uncertain	1.3
Attitude	3.27	Moderately Positive	1.11

Legend: 1.00-1.80 (SD/Very Negative); 1.81-2.60(D/Negative); 2.61-3.40(U/Moderately Positive);3.41-4.20(A/Positive); 4.21-5.00(SA/Very Positive)

Students whose teachers implement the public mathematics curriculum exhibit a generally uncertain attitude towards mathematics. Despite some statements indicating a moderately positive attitude, the majority of statements fall within the "Uncertain" category. Through the public mathematics curriculum, the government recognizes that public participation in mathematics education is still present. The curriculum promotes teamwork between educators and political decision-making. This promotes community organizations as well as community organizations to create and use successful mathematical learning experiences. Collaborative Strategy is actively working to build collective responsibility for mathematical training that determines the environment that supports learning for all. The public mathematics curriculum engages in creating integrated education models by understanding different approaches for learning and cultural backgrounds and personal preferences. The

curriculum uses modern educational strategies that combine problem-based learning and searching with technical equipment to build student benefits and at the same time improve understanding of mathematics.

Conclusion:

The present research examines the perceived effectiveness of the public mathematics curriculum from the teachers' and students' perspectives, its relationship to academic achievement, student attitudes, and challenges faced in its implementation. From these findings, there is an indication of how this curriculum is perceived by the key stakeholders in its application and delivery. In fact, both teachers and students rated perceived effectiveness of the curriculum within a neutral range, as this represents a moderate degree of satisfaction whereby there is no strong endorsement of the reviewed curriculum. Perception ratings by teachers and students were similar, and there were no significant differences in the evaluations between these groups, even when demographic considerations are accounted for. This means that the emphases and limitations of the curriculum are shared across these groups, which might be used to inform future revisions in pursuit of a curriculum better aligned with the needs of diverse learners. Although significant, the relation between perceived curriculum effectiveness and academic achievement presented a weak relation; it would, therefore, mean that increasing perceptions of effectiveness may have a small positive impact on student performance, but other factors may be more powerful in their impact on academic success. There was also a similarly weak but statistically significant positive correlation in the relation between perceived curriculum effectiveness and student attitudes toward its implementation. These findings indicate that enhancing perceptions of curriculum effectiveness might lead to small improvements in both attitudes and academic outcomes, though further efforts are needed to realize this impact.

The following challenges identified by the teachers in curriculum implementation are basically on assessment and grading, time constraints, and balancing differentiation with curriculum requirements; further support and resources may thus be required. Such measures could alleviate not only the stress on educators themselves but also heighten overall curriculum effectiveness to their good benefit of student learning outcomes.

REFERENCES

1. Alamri HA, Watson S, Watson W. Learning technology models that support personalization within blended learning environments in higher education. *TechTrends*. 2021;65:62–78.
2. Andrade H, Du Y. Student responses to criteria-referenced self-assessment. *Assessment & Evaluation in Higher Education*. 2007;32(2):159–181.
3. Boström E, Palm T. Expectancy-value theory as an explanatory theory for the effect of professional development programmes in formative assessment on teacher practice. *Teacher Development*. 2020;24(4):539–558.
4. Brooks C, Burton R, van der Kleij F, et al. Teachers activating learners: The effects of a student-centered feedback approach on writing achievement. *Teaching and Teacher Education*. 2021;105:103387.
5. Buabeng I, Atingane AB, Amoako I. Practices, challenges and perceived influence of classroom assessment on mathematics instruction. *International Journal of Assessment Tools in Education*. 2019;6(3):476–486.
6. Burkhardt H, Schoenfeld A. Not just "implementation": The synergy of research and practice in an engineering research approach to educational design and development. *ZDM Mathematics Education*. 2021;53(6):991–1005.
7. Christodoulou A, Angeli C. Adaptive learning techniques for personalized educational software in developing teachers' technological pedagogical content knowledge. *Frontiers in Education*. 2022;7:789397.
8. de Vries J, Van Gasse R, van Geel M, Visscher A, Van Petegem P. Profiles of teachers' assessment techniques and their students' involvement in assessment. *European Journal of Teacher Education*. 2024;47(2):369–388.

9. de Vries JA, Dimosthenous A, Schildkamp K, Visscher AJ. The impact on student achievement of an assessment for learning teacher professional development program. *Studies in Educational Evaluation*. 2022;74:101184.
10. Feldman Z, Wickstrom M, Ghosh Hajra S, Gupta D. The role of uncertainty in mathematical tasks for prospective elementary teachers. *The Mathematics Enthusiast*. 2020;17(2 & 3):641–672.
11. Gresham G. Exploring exceptional education preservice teachers' mathematics anxiety. *International Journal for the Scholarship of Teaching and Learning*. 2021;15(2):Article 13.
12. McPhail G, Tibbles S, Cornish M. Developing teacher curriculum design expertise: Using the CDC model in the music classroom. *British Journal of Music Education*. 2023;40(2):255-270.
13. McPhail G. The search for deep learning: A curriculum coherence model. *The Journal of Curriculum Studies*. 2020.
14. Morrow N, Rata E, Evans T. A study of the New Zealand mathematics curriculum. *University of Auckland*. 2021.
15. Musengimana J, Kampire E, Ntawiha P. Factors affecting secondary schools students' attitudes toward learning chemistry: A review of literature. *EURASIA Journal of Mathematics, Science and Technology Education*. 2021;17(1):em1931.
16. Nja CO, Orim RE, Neji HA, et al. Students' attitude and academic achievement in a flipped classroom. *Heliyon*. 2022;8:e08792.
17. Ramirez G, Hooper SY, Kersting NB, Ferguson R, Yeager D. Teacher math anxiety relates to adolescent students' math achievement. *AERA Open*. 2018;4(1):1–13.
18. Riegler-Crumb C, Morton K, Nguyen U, Dasgupta N. Inquiry-based instruction in science and mathematics in middle school classrooms: Examining its association with students' attitudes by gender and race/ethnicity. *AERA Open*. 2019;5(3):1–17.
19. Sandal AK, Helleve I, Smith K, Gamlem SM. Feedback practice in lower secondary school: Exploring development of perceptions of feedback practice among students and teachers. *Cogent Education*. 2022;9(1):2101236.