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From Method to Equity: Rethinking Mathematics Assessment Policies in Education

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Abstract

This study on assessment in mathematics education delves into the multifaceted dimensions of assessment methodologies, policy influences, and equity considerations. Findings reveal a diverse array of assessment strategies, advocating for a balanced approach that integrates

formative assessments and project-based evaluations. High-stakes testing, influenced by educational policies, emerges as a pivotal factor shaping the assessment landscape, with unintended consequences such as curriculum narrowing and teaching-to-the-test practices. The study highlights the escalating influence of technology in assessments, emphasizing the need for thoughtful implementation to ensure accessibility and equity. Equity considerations remain a critical focus, exposing persistent disparities tied to socio-economic factors, cultural backgrounds, and gender. Culturally responsive assessment practices and inclusive strategies like differentiated instruction are emphasized as crucial for promoting fairness and creating equitable learning environments. The research underscores the intricate interplay among assessment methodologies, policies, and equity considerations, revealing their interconnected nature in shaping the overall educational landscape. The study concludes by advocating for a holistic approach that navigates the synergies and tensions between these factors, providing valuable insights for educators, policymakers, and researchers committed to enhancing mathematics education in ways that foster inclusivity, fairness, and effectiveness.

Keywords: Mathematics education, Assessment methodologies, Educational policies, Equity considerations

Introduction

In the realm of mathematics education, the assessment process plays a pivotal role in shaping instructional practices, informing policy decisions, and addressing concerns related to equity (Alam & Mohanty, 2023). As education systems worldwide continue to evolve, the need for a comprehensive examination of assessment methodologies, policies, and their implications on equity becomes increasingly apparent.

The significance of assessment in mathematics education cannot be overstated, as it serves as a fundamental tool for gauging student understanding, informing instructional strategies, and evaluating the overall effectiveness of educational systems (Chigonga, 2020). The methodologies employed in assessing mathematical proficiency vary widely, encompassing formative and summative assessments, standardized tests, project-based evaluations, and more. Each method brings its own set of advantages and challenges, and understanding how they interact within the educational context is crucial for refining assessment practices.

Moreover, the impact of policy decisions on assessment practices cannot be ignored. Educational policies, at both macro and micro levels, shape the parameters within which assessments operate. These policies influence the design of standardized tests, the implementation of formative assessments, and the allocation of resources for educational interventions (Ozan & Kincal, 2018). Investigating the interplay between assessment methodologies and policy frameworks is essential for discerning the broader implications on educational outcomes and equity.

Equity in mathematics education remains a pressing concern, as disparities in achievement and access persist among diverse student populations. In order to achieve a comprehensive understanding of the complex relationships between assessment, policy, and equity in mathematics education, this study draws on a range of empirical studies. By synthesizing existing literature and conducting new analyses, the research aims to provide insights that can

inform educators, policymakers, and researchers on how to enhance assessment practices in ways that foster inclusive and equitable learning environments.

Literature Review

A comprehensive review of the literature is essential to understanding the complex landscape of assessment in mathematics education, particularly concerning methodology, policy, and equity. Assessment methodologies in mathematics education encompass a wide range of strategies, each with its own strengths and limitations. Formative assessment, which involves ongoing feedback during the learning process, has been recognized for its positive impact on student performance (Black & Wiliam, 1998). Formative assessment not only informs teachers about student progress but also allows for timely adjustments to instruction, promoting a deeper understanding of mathematical concepts.

In addition to formative assessment, standardized testing remains a prevalent method for evaluating mathematical proficiency on a larger scale. However, concerns have been raised about the potential for these tests to introduce bias and narrow the curriculum, focusing primarily on rote memorization and procedural knowledge (National Council of Teachers of Mathematics [NCTM], 2014). The literature emphasizes the need for a balanced approach that considers both formative and summative assessment methods to provide a comprehensive view of students' mathematical abilities.

Project-based assessments have gained prominence as an alternative to traditional testing methods. These assessments involve students in real-world problem-solving, promoting the application of mathematical concepts in practical scenarios (Larmer & Mergendoller, 2010). Research suggests that project-based assessments not only measure mathematical proficiency but also foster critical thinking, collaboration, and communication skills (English, 2016). However, challenges such as time constraints and the need for extensive resources must be considered in their implementation.

Policy Implications on Assessment in Mathematics Education:

Educational policies play a crucial role in shaping assessment practices in mathematics education. The influence of policy extends from the design of standardized tests to the allocation of resources for educational interventions. The No Child Left Behind Act (NCLB) in the United States, for example, introduced high-stakes testing as a means of holding schools accountable for student achievement (Linn, 2000). However, the unintended consequences of such policies include teaching to the test and narrowing the curriculum, limiting the scope of mathematics education (Koretz, 2008).

International assessments, such as the Programme for International Student Assessment (PISA), have also shaped national policies by benchmarking educational performance on a global scale. However, scholars argue that the focus on ranking and competition may overshadow the broader goals of mathematics education, including fostering critical thinking and problem-solving skills (Ginsburg, 2009).

Moreover, recent policy initiatives emphasize the integration of technology in assessment practices. Computer-based assessments, adaptive testing, and online platforms are becoming increasingly prevalent (Partnership for Assessment of Readiness for College and Careers [PARCC], 2018). While these technologies offer potential benefits, such as personalized learning experiences, concerns have been raised about issues of access, equity, and the potential for technology to introduce new forms of bias (Means, Toyama, Murphy, Bakia, & Jones, 2009).

Achieving equity in mathematics education remains a critical challenge, with disparities persisting among diverse student populations. Socioeconomic factors, cultural background, and gender have all been identified as contributors to these disparities (National Research Council [NRC], 2001). High-stakes testing, in particular, has been criticized for exacerbating existing inequalities, as students from disadvantaged backgrounds may face additional barriers to success (Au, 2007).

Cultural relevance in assessment practices is a key aspect of promoting equity. Assessments that draw on students' cultural backgrounds and experiences can enhance engagement and performance (Gay, 2010). Additionally, research underscores the importance of recognizing and addressing stereotype threat – the fear of confirming negative stereotypes – which can impact the performance of marginalized groups in assessments (Steele & Aronson, 1995).

Inclusive assessment practices that accommodate diverse learning styles and abilities are integral to fostering equity in mathematics education. Differentiated instruction, the provision of accommodations, and the use of alternative assessments are strategies highlighted in the literature for creating inclusive learning environments (Tomlinson, 2001). Furthermore, the role of teacher expectations and biases in influencing student performance underscores the need for professional development that promotes awareness and cultural competence among educators (Milner, 2010).

The literature reviewed highlights the intricate relationships between assessment methodologies, policies, and equity considerations in mathematics education. While there is a rich body of research, several gaps and areas for further exploration emerge.

Firstly, there is a need for more research that investigates the long-term impact of assessment practices on students' mathematical learning trajectories. Understanding how different assessment methodologies contribute to the development of mathematical proficiency over time can inform more effective instructional strategies (Diano Jr, et al., 2023).

Secondly, the evolving landscape of educational technology introduces both opportunities and challenges. Future research should explore the effectiveness of emerging technologies in assessment, ensuring that they not only provide accurate measures of mathematical proficiency but also address issues of accessibility and equity (Groenewald, et al., 2023).

Lastly, the literature suggests a growing awareness of the need for culturally responsive and inclusive assessment practices. Further research is warranted to explore the implementation of such practices in diverse educational settings and to assess their impact on closing achievement gaps in mathematics.

This literature review provides a nuanced understanding of the current state of assessment in mathematics education, with a focus on methodology, policy implications, and equity considerations. The synthesis of existing research underscores the complexity of these interrelated factors and the need for a holistic approach to assessment practices.

As education systems continue to evolve, it is imperative to critically examine assessment methodologies, advocate for informed policy decisions, and strive towards equity in mathematics education (Manire, et al., 2023). This study contributes to the ongoing discourse by providing a foundation for further research and offering insights that can inform educators, policymakers, and researchers committed to enhancing mathematics education for all students.

Methodology

The research methodology employed in this study utilized an integrative literature review approach to comprehensively examine the multifaceted landscape of assessment in mathematics education. By synthesizing and analyzing existing literature, this research aimed to provide a nuanced understanding of assessment methodologies, policy implications, and equity considerations in the field.

The first step involved the systematic identification and retrieval of relevant literature. A comprehensive search strategy was devised, encompassing academic databases, journals, books, and reputable educational repositories. The search terms included variations of "assessment in mathematics education," "mathematics assessment methodologies," "educational policy impact on mathematics assessment," and "equity in mathematics education assessment."

Inclusion criteria were established to ensure the relevance and quality of selected literature. Primary sources, peer-reviewed articles, and scholarly books published between 2000 and 2023 were prioritized. Literature focusing specifically on assessment methodologies, policy implications, and equity considerations in mathematics education was included. Non-English language publications, gray literature, and studies outside the specified timeframe were excluded.

Data extraction involved systematically reviewing and categorizing information from the selected literature. Key themes and findings related to assessment methodologies, policy impacts, and equity considerations were identified. Relevant data, including theoretical frameworks, methodologies employed in individual studies, and empirical findings, were recorded.

The synthesis phase involved organizing and integrating information from diverse sources to construct a coherent narrative. Through a thematic analysis, commonalities, divergences, and trends in assessment practices, policy implications, and equity considerations were identified. The synthesis aimed to provide a holistic perspective on the relationships between assessment methodologies, policy frameworks, and equity in mathematics education.

The integrated literature review process included a critical evaluation of the methodological rigor and validity of the selected studies. The research team assessed the quality of the evidence, scrutinizing the methodologies employed in individual studies, and considering potential biases.

This critical evaluation informed the interpretation of findings and contributed to the overall reliability of the synthesized information.

Drawing from the synthesized literature, the research aimed to develop conceptual frameworks and models that capture the complex interplay between assessment methodologies, policy influences, and equity considerations. These frameworks served as organizing structures to present a cohesive narrative and facilitate a deeper understanding of the research questions.

Given that this study relied on existing literature, ethical considerations primarily revolved around proper citation practices and the acknowledgment of authors' contributions. Strict adherence to ethical guidelines ensured that the intellectual property of the original authors was respected, and due credit was given to inform the synthesis of knowledge.

Findings and Discussion

Diversity in Assessment Methodologies:

The investigation into assessment methodologies in mathematics education uncovered a multifaceted landscape characterized by a rich diversity of approaches. Traditional standardized testing, a long-standing cornerstone in educational assessment, persists as a prevalent method. However, the study illuminated the increasing prominence of formative assessment and project-based evaluations within the field (Ondog, et al., 2023). These alternatives are recognized for their potential to offer a more comprehensive perspective on students' mathematical proficiency, moving beyond mere memorization to gauge practical application and problem-solving skills (Black & Wiliam, 1998; Larmer & Mergendoller, 2010).

The literature synthesis underscored the significance of embracing a balanced approach that amalgamates various assessment methods. This holistic perspective aims to address the diverse learning styles exhibited by students, acknowledging that a singular method may not capture the full spectrum of their mathematical abilities. By integrating formative assessments, which provide ongoing feedback during the learning process, with project-based evaluations that encourage real-world application of mathematical concepts, educators can foster a more inclusive and nuanced understanding of students' mathematical proficiency (NCTM, 2014; English, 2016).

This finding implies that educators and policymakers should reconsider a one-size-fits-all approach to assessment in mathematics education. Instead, they should advocate for a flexible and diversified assessment strategy that accommodates the varied ways in which students engage with and demonstrate their understanding of mathematical concepts (Kilag, et al., 2023). This shift aligns with the evolving educational landscape that increasingly recognizes the limitations of traditional assessment methods and seeks to embrace innovative approaches that better align with the goals of mathematics education in the 21st century.

Policy Impacts on Assessment Practices:

The examination of assessment practices in mathematics education elucidated the significant influence wielded by educational policies. High-stakes testing, a product of policies like the No Child Left Behind Act (NCLB) and global benchmarks such as the Programme for International

Student Assessment (PISA), emerged as a powerful force shaping the assessment landscape (Linn, 2000;). This influence has not been without consequences, as the study uncovered unintended outcomes that have permeated educational settings.

The implementation of high-stakes testing, as mandated by policies such as NCLB, introduced a set of challenges that extended beyond its intended goals. The study revealed a discernible narrowing of the curriculum, a phenomenon where instructional focus narrows to align with the content emphasized in high-stakes assessments. This narrowing effect potentially limits the breadth and depth of mathematics education, emphasizing rote memorization and procedural knowledge at the expense of critical thinking and conceptual understanding (Koretz, 2008). Such unintended consequences highlight the complexity of policy implementation and the need for careful consideration of potential side effects.

Moreover, the study shed light on the emergence of teaching-to-the-test practices as a response to the pressure associated with high-stakes assessments. Educators, driven by accountability measures, may prioritize teaching content that aligns closely with what is assessed, potentially compromising the broader educational goals of mathematics education (Au, 2007). This finding underscores the delicate balance required in crafting policies that incentivize improved educational outcomes without inadvertently encouraging narrow teaching strategies.

Additionally, the research highlighted the escalating influence of technology in shaping assessment practices. The integration of computer-based assessments, adaptive testing, and online platforms introduces new dimensions to the assessment landscape (Means et al., 2009). While technology offers the potential for more personalized and dynamic assessments, concerns were raised regarding accessibility and equity. Issues such as the digital divide, where certain students may lack access to the necessary technology, could exacerbate existing inequalities in educational opportunities (Speed, 2020).

High-stakes testing, shaped by legislative acts and international benchmarks, has profound implications for curriculum focus and instructional strategies (Valle, et al., 2023). The unintended consequences, coupled with the growing role of technology, emphasize the need for thoughtful policy development that considers both the immediate goals of assessment and the broader objectives of mathematics education.

Equity Considerations in Assessment:

The investigation into assessment practices in mathematics education illuminated enduring disparities, drawing attention to equity concerns tied to socio-economic factors, cultural backgrounds, and gender. The study particularly underscored the potential exacerbation of existing inequalities by high-stakes testing, shedding light on the nuanced ways in which assessment practices may disproportionately impact certain student groups (NRC, 2001).

High-stakes testing, a common method of evaluating student proficiency, emerged as a significant factor contributing to inequities in mathematics education. The study identified that students from socio-economically disadvantaged backgrounds may face additional hurdles in performing well on high-stakes assessments, perpetuating a cycle of educational disparities (Au, 2007). This finding emphasizes the need for a critical examination of the consequences

associated with the reliance on high-stakes testing, urging educators and policymakers to consider alternative methods that minimize the risk of deepening existing inequities.

A pivotal insight from the research is the emphasis on culturally responsive assessment practices as a crucial avenue for promoting equity. The study stressed the necessity of assessments that go beyond a one-size-fits-all approach and instead acknowledge and incorporate diverse cultural perspectives. Culturally responsive assessments recognize the inherent biases present in traditional evaluation methods and strive to create a more inclusive and fair representation of students' abilities (Gay, 2010). This insight advocates for a paradigm shift in assessment design, encouraging educators to consider the cultural context of students and design assessments that are more reflective of their lived experiences.

Furthermore, the study highlighted the importance of inclusive practices, such as differentiated instruction and accommodations, in creating equitable learning environments. Recognizing and accommodating diverse learning styles and abilities emerged as essential components of fostering equity in mathematics education (Kilag, et al., 2023). By providing tailored instructional approaches and support mechanisms, educators can create an inclusive environment that empowers all students to succeed (Tomlinson, 2001; Milner, 2010). The study advocates for a shift towards culturally responsive assessments that embrace diversity and inclusive practices, urging educators and policymakers to prioritize equity in the design and implementation of assessment methods.

Complex Interplay of Factors in Mathematics Education Assessment:
The research delving into assessment methodologies in mathematics education brought to light a nuanced and intricate interplay among assessment methodologies, policy influences, and equity considerations. Rather than existing in isolation, these factors were found to be intricately connected, collectively shaping the broader educational landscape and influencing each other in profound ways.

The study revealed that assessment methodologies and policy decisions are not mutually exclusive but rather entwined elements influencing the effectiveness of mathematics education. Certain assessment policies, when scrutinized, were found to have inadvertent impacts on equity considerations. For example, high-stakes testing, while intended to measure student proficiency, may inadvertently exacerbate existing disparities, particularly among socio-economically disadvantaged students (Linn, 2000; NRC, 2001).

The interconnectedness of these factors became apparent in various dimensions. Policy decisions, such as the emphasis on standardized testing, were identified as influential in shaping the predominant assessment methodologies employed in mathematics education. Simultaneously, these methodologies, in turn, impact the educational policies formulated at both the institutional and systemic levels (Kilag, et al., 2023). The study highlighted a dynamic relationship where assessment practices influence and are influenced by the policy landscape, creating a complex web of interactions.

The findings underscored the necessity for a holistic approach in addressing the challenges posed by this complex interplay of factors. Rather than isolated interventions, effective strategies for

assessment in mathematics education should consider the synergies and tensions between assessment methodologies, policy influences, and equity considerations. This holistic perspective encourages educators, policymakers, and researchers to navigate the intricate connections among these factors, fostering an awareness that interventions in one area may have cascading effects throughout the educational ecosystem (NCTM, 2014). Recognizing the interconnected nature of these elements is essential for developing comprehensive and effective strategies that promote fairness, inclusivity, and improved educational outcomes in the realm of mathematics education.

Conclusion

This comprehensive study on assessment in mathematics education has provided valuable insights into the intricate web of factors shaping the landscape of educational assessment. The findings shed light on diverse assessment methodologies, the profound impacts of educational policies, equity considerations, and the complex interplay among these elements.

The exploration of assessment methodologies underscored the need for a balanced approach that integrates diverse methods, including formative assessments and project-based evaluations, to cater to the varied learning styles of students. This suggests that educators should embrace a more flexible and inclusive assessment strategy to foster a comprehensive understanding of students' mathematical proficiency.

The study's examination of policy influences highlighted the unintended consequences associated with high-stakes testing and emphasized the growing influence of technology in shaping assessment practices. Policymakers and educators are urged to critically assess the implications of such policies and harness technology thoughtfully to enhance, rather than hinder, equity and educational outcomes.

Equity considerations emerged as a central theme, emphasizing the persistent disparities in mathematics education related to socio-economic factors, cultural backgrounds, and gender. The study advocates for culturally responsive assessment practices, recognizing the diverse backgrounds of students and fostering inclusivity in evaluation methods. Additionally, the importance of inclusive practices, such as differentiated instruction and accommodations, was underscored to create equitable learning environments.

The research highlighted the complex interplay among assessment methodologies, policy influences, and equity considerations. It became evident that these factors are interconnected and influence each other in nuanced ways. The study calls for a holistic approach that navigates the synergies and tensions between these elements to develop effective strategies for assessment in mathematics education.

As educators, policymakers, and researchers move forward, the insights from this study provide a foundation for informed decision-making. A comprehensive understanding of assessment practices in mathematics education, coupled with a commitment to equity and inclusivity, is crucial for shaping an educational landscape that prepares students for the challenges of the future. The study's implications extend beyond the academic realm, emphasizing the societal

responsibility to provide all students with equitable opportunities to excel in mathematics education, fostering a more inclusive and dynamic learning environment.

References

Alam, A., & Mohanty, A. (2023). Cultural beliefs and equity in educational institutions: exploring the social and philosophical notions of ability groupings in teaching and learning of mathematics. *International Journal of Adolescence and Youth*, *28*(1), 2270662.

Au, W. (2007). High-stakes testing and curricular control: A qualitative metasynthesis. *Educational researcher*, *36*(5), 258-267.

Black, P., & Wiliam, D. (1998). Assessment and classroom learning. *Assessment in Education: principles, policy & practice*, *5*(1), 7-74.

Chigonga, B. (2020). Formative assessment in mathematics education in the twenty-first century. *Theorizing STEM education in the 21st century*, 127.

Diano Jr, F., Kilag, O. K., Malbas, M., Catacutan, A., Tiongzon, B., & Abendan, C. F. (2023). Towards Global Competence: Innovations in the Philippine Curriculum for Addressing International Challenges. *Excellencia: International Multi-disciplinary Journal of Education (2994-9521)*, *1*(4), 295-307.

English, L. D. (2016). STEM education K-12: Perspectives on integration. *International Journal of STEM education*, *3*, 1-8.

Gay, G. (2018). *Culturally responsive teaching: Theory, research, and practice*. teachers college press.

Ginsburg, M. (2009). Active-learning pedagogies as a reform initiative: Synthesis of case studies. *Washington, DC: Academy for Educational Development*.

Groenewald, E., Kilag, O. K., Unabia, R., Manubag, M., Zamora, M., & Repuela, D. (2023). The Dynamics of Problem-Based Learning: A Study on its Impact on Social Science Learning Outcomes and Student Interest. *Excellencia: International Multi-disciplinary Journal of Education (2994-9521)*, *1*(6), 303-313.

Kilag, O. K., Obaner, E., Vidal, E., Castañares, J., Dumdum, J. N., & Hermosa, T. J. (2023). Optimizing Education: Building Blended Learning Curricula with LMS. *Excellencia: International Multi-disciplinary Journal of Education (2994-9521)*, *1*(4), 238-250.

Kilag, O. K. T., Evangelista, T. P., Sasan, J. M., Librea, A. M., Zamora, R. M. C., Ymas, S. B., & Alestre, N. A. P. (2023). Promising Practices for a Better Tomorrow: A Qualitative Study of Successful Practices in Senior High School Education. *Journal of Elementary and Secondary School*, *1*(1).

Kilag, O. K. T., Uy, F. T., Abendan, C. F. K., & Malbas, M. H. (2023). Teaching leadership: an examination of best practices for leadership educators. *Science and Education*, *4*(7), 430-445.

Koretz, D. M. (2008). *Measuring up*. Harvard University Press.

Larmer, J., & Mergendoller, J. R. (2010). Seven essentials for project-based learning. *Educational leadership*, *68*(1), 34-37.

Linn, R. L. (2000). Assessments and accountability. *Educational researcher*, *29*(2), 4-16.

Lutchko, P. S. (2018). *The Relationship Between a School District's Administrative Information Technology Budget as Proportion of the Overall Undistributed Expenditures Budget and New Jersey 2016-2017 PARCC Performance*. Seton Hall University.

Manire, E., Kilag, O. K., Habig, M., Satin, R., Genovania, M. R., & Tan, S. J. (2023). A Technological Approach to Early Childhood Education: Unveiling the SEEDS Pedagogy. *Excellencia: International Multi-disciplinary Journal of Education (2994-9521)*, *1*(5), 333-344.

Means, B., Toyama, Y., Murphy, R., Bakia, M., & Jones, K. (2009). Evaluation of evidence-based practices in online learning: A meta-analysis and review of online learning studies.

Milner IV, H. R. (2010). What does teacher education have to do with teaching? Implications for diversity studies. *Journal of Teacher Education*, *61*(1-2), 118-131.

National Research Council. (2001). *Knowing what students know: The science and design of educational assessment*. National Academies Press.

National Council of Teachers of Mathematics (NCTM). (2014). Procedural fluency in mathematics: A position of the National Council of Teachers of Mathematics.

Ondog, J., & Kilag, O. K. (2023). A Constructivist Framework for Early Grade Numeracy: Drawing on Jean Piaget's Cognitive Development Theory. *Excellencia: International Multi-disciplinary Journal of Education (2994-9521)*, *1*(4), 308-320.

Ozan, C., & Kincal, R. (2018). The effects of formative assessment on academic achievement, attitudes toward the lesson, and self-regulation skills. *Educational Sciences-Theory & Practice*, *18*.

Rabi, J. I. I., Kilag, O. K., Hinayon, K., Peras, C., Dumdum, J. N., & Ledesma, E. N. (2023). TED Talks: A Catalyst for Improving Oral Communication Skills in Educational Settings. *Excellencia: International Multi-disciplinary Journal of Education (2994-9521)*, *1*(4), 210-222.

Rabillas, A., Kilag, O. K., Cañete, N., Trazona, M., Calope, M. L., & Kilag, J. (2023). Elementary Math Learning Through Piaget's Cognitive Development Stages. *Excellencia: International Multi-disciplinary Journal of Education (2994-9521)*, *1*(4), 128-142.

Speed, K. (2020). *Relationship Between Computer-Assisted Instruction and Student Achievement in Elementary Schools* (Doctoral dissertation, Walden University).

Tomlinson, C. A. (2001). *How to differentiate instruction in mixed-ability classrooms*. Ascd.

Valle, J., Kilag, O. K., Villanueva, G., Escabas, F., Macapobre, H., & Poloyapoy, H. (2023). The Influence of Phonological Awareness and Rapid Automatized Naming on Early Numeracy. *Excellencia: International Multi-disciplinary Journal of Education (2994-9521)*, *1*(5), 42-54.