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In memory of Jan de Lange and Kees Hoogland: Honoring their legacy and contributions to mathematics education in Indonesia

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Abstract

Inspired by the wisdom of Ali bin Abi Talib—that written legacies outlive their authors—this paper presents a scientific narrative exploring the contributions of Professor Jan de Lange (JDL) to the global and Indonesian mathematics education landscape. Renowned for his work in Realistic Mathematics Education (RME), the Trends in International Mathematics and Science Study (TIMSS), and the Programme for International Student Assessment (PISA), JDL played a pivotal role in the transformation of Indonesia's mathematics education reform in the late 1990s. His engagement began in 1998 when, alongside Prof. Tjeerd Plomp, he responded to an invitation from Prof. R.K. Sembiring and Drs. Pontas Hutagalung to introduce RME as an alternative to the outdated modern mathematics approach. This effort led to the birth of Pendidikan Matematika Realistik Indonesia (PMRI). The reform initiative included the selection and training of Indonesian doctoral candidates through a collaborative workshop held at Institut Teknologi Bandung (ITB), resulting in advanced studies in the Netherlands. Among these scholars was Prof. Zulkardi and Prof. Sutarto Hadi, who became a central figure in promoting RME and PMRI in Indonesia. JDL's involvement continued through mentorship, keynote lectures, and academic collaborations, significantly influencing mathematics education policy and practice. His thought-provoking publications reflect his enduring commitment to curiosity-driven, student-centered learning. The paper also acknowledges the contributions of Prof. Kees Hoogland, JDL's close colleague and fellow RME advocate. Together, their work exemplifies a vision of mathematics as meaningful, contextual, and empowering. Their legacy lives on through generations of educators and learners shaped by their transformative ideas.

Keywords: Jan de Lange, Kees Hoogland, Lifelong Dedication, Obituary, PISA, PMRI, RME

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Ali bin Abi Talib, a revered companion of the Prophet Muhammad, once stated, "All writers will die, but what they have written will remain forever. So, write something worth remembering in the hereafter." Inspired by this timeless wisdom, the present paper offers a scholarly narrative highlighting the enduring contributions of one of the most influential figures in international mathematics education: Professor Jan de Lange (JDL). Through his visionary work in research, reform, and policy, JDL has profoundly shaped the landscape of mathematics education—most notably through his leadership in the development of Realistic Mathematics Education (RME), and his significant roles in large-scale assessment frameworks such as the Trends in International Mathematics and Science Study (TIMSS) and the Programme for International Student Assessment (PISA).

A pivotal moment in the development of mathematics education in Indonesia occurred in 1998, when JDL, accompanied by Professor Tjeerd Plomp (TP), visited the country at the invitation of Professor R.K. Sembiring (RKS). This visit followed JDL's keynote address at the International Commission on Mathematical Instruction (ICMI) conference in Shanghai and coincided with a broader curricular shift in Indonesia—from rigid, formalist approaches to more context-based, learner-centered methodologies. The idea of PMRI began gaining traction in Indonesia after RKS and Drs. Pontas Hutagalung returned from the same ICMI conference, inspired by the principles presented there. Ultimately, JDL's visit served as a catalyst for the introduction and adaptation of the Dutch RME framework in Indonesia, which evolved into what is now known as PMRI.

With strong support from Dutch and Indonesian academics, JDL and TP played an instrumental role in launching a collaborative academic initiative that began with the selection of future doctoral students through a rigorous screening process. A one-week academic workshop, held at the Mathematics Department of Institut Teknologi Bandung (ITB), identified six promising scholars from thirty applicants. These scholars were subsequently enrolled in a one-year master's program in the Netherlands as a preparatory stage for their doctoral studies. This foundational year culminated in a proposal seminar in 1999, through which four candidates progressed to the doctoral level—underscoring the high academic standards of the program. Among them was Prof. Zulkardi (Z) and Prof. Sutarto Hadi, who later emerged as a central figure in the advancement of PMRI within Indonesia (Zulkardi, 2002; Hadi, 2002).

JDL's involvement extended well beyond initial recruitment. He returned to Indonesia in 2000 as a keynote speaker at the 10th National Mathematics Conference at ITB, where he introduced the conceptual underpinnings of PISA mathematics. As chair of the PISA mathematics framework at the Organisation for Economic Co-operation and Development (OECD), his perspectives galvanized increased interest and engagement in international assessment research among Indonesian educators. His collaborations with Z continued in various international academic forums, including the 25th Psychology of Mathematics Education (PME) Conference in 2001 and the 14th International Congress on Mathematical Education (ICME-14) in Hamburg (2016). Notably, at ICME-14, JDL co-led a workshop titled Curiosity: Learn Through Play, reflecting his enduring commitment to inquiry-based, meaningful mathematics learning as shown in Figure 1.

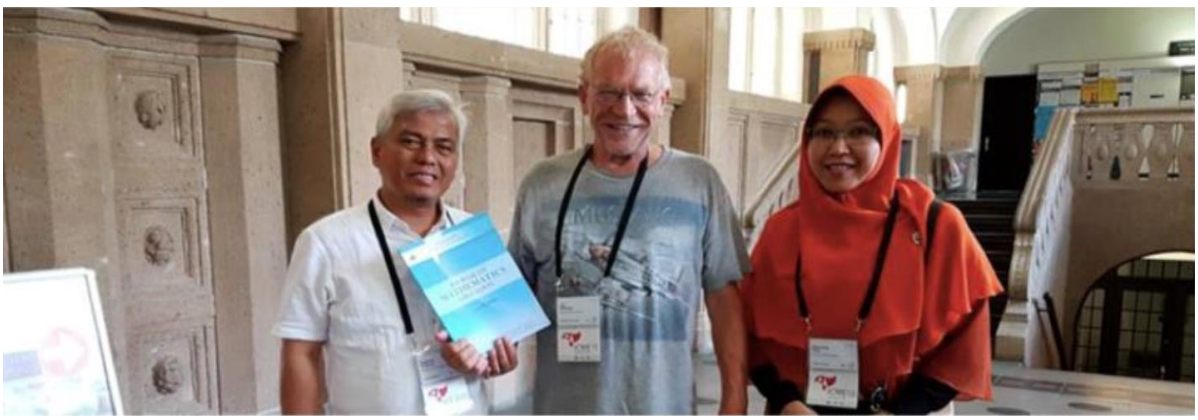

Figure 1. JDL with Prof. Zulkardi (Editor-in-Chief of JME) and Prof. Ratu Ilma Indra Putri (Editor-in-Chief of MEJ)

JDL also played a critical role in the academic supervision of Indonesian doctoral students. He served as the principal advisor to Z from 1998 to 2002, mentoring him through coursework and dissertation research in RME. This mentorship culminated in a successful doctoral defense in December

2002, with distinguished figures such as Prof. Jan van den Akker, Nienke Nieveen, and Prof. Thomas A. Romberg—former president of the National Council of Teachers of Mathematics (NCTM)—serving as examiners (Zulkardi, 2002).

Concurrently, KH, a close colleague and fellow advocate of RME, made significant contributions to both the theoretical and practical dimensions of mathematics education. His scholarly work addressed critical areas such as numeracy, digitalization, and educational equity. He was also an invited speaker at both the ICME-14 in Hamburg and the 16th ICME (ICME-16) in Sydney, where he appeared alongside Z and Professor Ratu Ilma Indra Putri (RIIP). Figure 2 captures an informal happy lunch gathering with KH, Z, and RIIP at the International Convention Centre (ICC) in Sydney on July 8, 2024—one year before KH's passing.

Figure 2. Informal lunch gathering with KH, Z, and RIIP at the International Convention Centre (ICC), Sydney

Among his most influential contributions to the Indonesian context is his role as co-editor, alongside RKS and Professor Maarten Dolk (MD), of the book A Decade of PMRI. This book was officially launched at the Kuala Lumpur Convention Center (KLCC) and publicly presented during the 23rd International Congress for School Effectiveness and Improvement (ICSEI), held from January 5 to 8, 2010, as illustrated in Figure 3.

Figure 3. ICSEI President Antony Mackay receives A decade of PMRI in Indonesia from RKS, KH, and MD

This book chronicles the evolution of PMRI over ten years, detailing how a dedicated network of Indonesian and Dutch educators collaboratively developed and implemented a reform-oriented mathematics education system (Sembiring et al., 2010). Through a combination of in-service workshops, classroom-based design research, instructional material development, and the establishment of educational standards, the PMRI team redefined how mathematics is taught and learned in Indonesian schools (Zulkardi & Putri, 2019). These efforts were supported by the academic supervision of postgraduate students, further reinforcing the sustainability of the reform. Together, JDL and KH represent a vision of mathematics education grounded not in rote calculation but in contextual problem solving, critical thinking, and learner empowerment. Their influence transcends scholarly publications and policy documents. It is most visibly manifested in classrooms across Indonesia and beyond, where mathematics is taught as a human-centered, meaningful, and transformative discipline.

While extensive research has explored the implementation of RME and its contextual adaptation (Gravemeijer et al., 2017) in Indonesia (Zulkardi, 2002; Revina, 2017), relatively little attention has been paid to the personal and institutional narratives that supported the internationalization of mathematics education reform in Southeast Asia—particularly in Indonesia. This study seeks to address this gap by offering a historically grounded, narrative account of the collaborative contributions of JDL and KH, with particular focus on the establishment, development, and sustainability of PMRI. Anchored in descriptive inquiry, the study investigates how JDL's academic and policy work influenced the trajectory of mathematics education reform in Indonesia, how the partnership between Dutch and Indonesian scholars—through the PMRI movement—impacted teacher professional development and classroom practices, and what lessons can be drawn from the mentorship and leadership of both JDL and KH in advancing transnational reform in mathematics education. By situating these contributions within both local and global contexts, this research offers a nuanced understanding of how educational reforms are co-constructed across cultural and institutional boundaries. In doing so, it contributes to the broader historical and pedagogical discourse on international collaboration in mathematics education and provides valuable insights for future reform efforts in similarly diverse and evolving educational settings.

METHODS

This study adopts a qualitative, descriptive narrative approach to document and analyze the scholarly and institutional contributions of JDL and KH to mathematics education, with particular attention to their influence on the development of PMRI. The research methodology is grounded in historical inquiry and draws from multiple data sources to construct a comprehensive and contextualized account of their academic legacy (Grimalt-Alvaro & Ametller, 2021; Kelly, 2023).

Data were collected through the triangulation of several credible sources. First, information was gathered from individuals closely connected to both scholars, providing personal insights into their mentorship, collaborations, and institutional engagements. Second, the study reviewed key publications authored or co-authored by JDL and KH, including peer-reviewed journal articles, book chapters, and edited volumes that reflect their research philosophies and reform strategies. Third, transcripts, recordings, and summaries of keynote addresses delivered by the two scholars at prominent international conferences—such as ICME, PME, and OECD-related forums—were analyzed to capture their public discourse and thought leadership. Finally, information from reliable institutional and academic websites was consulted to supplement and verify the collected data.

All sources were carefully curated, categorized, and synthesized to generate a descriptive account that not only outlines the biographical trajectories of JDL and KH but also maps their enduring contributions to the internationalization of mathematics education reform. By using this method, the study seeks to bridge gaps in the existing literature—which has largely focused on the technical and curricular aspects of RME—by foregrounding the human and institutional narratives that supported its transnational diffusion, particularly in Indonesia. This methodological orientation allows for a more holistic understanding of how mathematical reform is shaped not only by pedagogical theory but also by long-term academic collaboration, leadership, and vision.

RESULTS AND DISCUSSION

This section presents the professional journeys of JDL and KH, two renowned mathematicians whose contributions have significantly influenced the development of mathematics education globally, and in particular, in Indonesia. By documenting their academic legacies and impact, this paper aims to honor their lifelong dedication to advancing mathematics education. The authors hope that the contributions, values, and exemplary practices demonstrated by JDL and KH throughout their careers will serve as a source of inspiration for current and future researchers, educators, and practitioners in the field of mathematics education, both in Indonesia and around the world.

In Memory of Jan de Lange (JDL)

JDL has played a pivotal role in shaping the author's academic and professional journey, particularly during the doctoral studies undertaken at the University of Twente. His influence extends well beyond individual mentorship, encompassing significant contributions to the field of mathematics education through groundbreaking research, innovative curriculum development, and a sustained commitment to fostering critical and reflective mathematical thinking.

As a direct beneficiary of his mentorship, Z expresses deep appreciation for JDL's intellectual guidance and scholarly inspiration. His unwavering dedication to academic rigor and his transformative vision for mathematics education continue to shape the Z's research trajectory and pedagogical commitments. This article offers a scholarly tribute to JDL's enduring contributions, presenting a comprehensive overview of his academic achievements, professional legacy, and the global impact of his work. Through this reflective narrative, the paper seeks to highlight the sustained influence of a distinguished educator and mentor whose work has profoundly advanced the discipline of mathematics education, both in the Netherlands and internationally.

Short Biography of Jan de Lange (August 16, 1943 – March 13, 2025)

The life of JDL was marked by intellectual curiosity, resilience, and deep interpersonal connections. Born on August 26, 1943, in Leiden, the Netherlands, to Johannes de Lange and Johanna Maria Elisabeth Wakka, he demonstrated a lifelong passion for learning and exploration. His personal and professional life evolved through various stages, shaped by a strong commitment to family and community. In 1996, he settled in Katwijk and married Els Feijs, with whom he had two children, Kasper (1996) and Karlijn (1998). Despite later parting ways, he remained a dedicated father, nurturing close bonds with his children. In his later years, he found lasting companionship with Elsa Pronk, who provided unwavering support, particularly during his illness. JDL was known for his vitality, warmth, and joy for life—qualities often expressed through his characteristic laughter and appreciation for the simple and extraordinary moments of daily life. The word "fantastic" encapsulated his enduring gratitude and enthusiasm for life.

Beyond his remarkable academic and professional achievements, JDL cultivated a rich personal life filled with passions that reflected his multifaceted character. A skilled hobby pilot and avid aviation enthusiast, he delighted in flying across the Netherlands and abroad, often sharing these experiences with family, friends, and colleagues. His interest in World War II aircraft led him to numerous museums and airshows worldwide. He was also a committed sportsman, finding joy in running and cycling along the Katwijk coast, and he maintained a deep appreciation for travel and nature. His academic travels, particularly to the United States, often became opportunities for family exploration and cultural exchange. In his later years, he turned his attention to rediscovering Europe and engaging more actively in local community initiatives. JDL passed away on March 13, 2025, following complications from a brain injury sustained in 2021. He was remembered not only for his extraordinary contributions to mathematics education but also for his generosity, integrity, and enduring love for his family. His life and legacy was commemorated on March 19, 2025, in Katwijk, where those who knew, him are invited to pay tribute and share their memories. Those wishing to extend condolences or share memories may do so at https://www.memori.nl/gedenkplaats/jan-de-lange-1.

Academic Background and Professional Trajectory

JDL was a distinguished academic and researcher whose career was dedicated to advancing mathematics education. He earned a degree in Mathematics from Leiden University in 1972 and later obtained his Ph.D. in Mathematics Education from Utrecht University in 1987. His doctoral research focused on curriculum design and assessment, which became the foundation for his later contributions to the field.

Following his initial years as a mathematics teacher at high schools, he joined IOWO (Instituut voor de Ontwikkeling van Wiskunde Onderwijs) in 1976, an institute focused on the development of mathematics education. He was hired at IOWO by Professor Freudenthal and Martin Kindt started in 1971. Over the years, the institute evolved, first into OW&OC in 1981 and later into the renowned Freudenthal Institute in 1991. By 1989, he was appointed as the director and full professor of the Freudenthal Institute, where he spearheaded extensive research and development initiatives. Under his leadership, the institute grew to employ over 80 researchers, becoming a leading center for mathematics education research and curriculum innovation. JDL was a man with a mission: innovation in mathematics education by means of connecting research and practice (design and developmental research).

Contributions to Mathematics Education

JDL was a visionary leader in mathematics education who excelled in building collaborative and dynamic teams, enabling innovation and excellence. He advocated for a flat, informal, and adaptable organizational structure that fostered open communication and interdisciplinary cooperation. JDL played a central role in bridging the gap between key stakeholders—including policymakers, researchers, educators, and textbook authors—by developing effective dissemination strategies and networks. Known for his groundbreaking ideas and provocative perspectives, he consistently challenged conventional thinking and promoted forward-looking approaches to mathematics education. His international collaborations helped validate theoretical models and led to the implementation of educational projects across diverse contexts, including the United States, Bolivia, South Africa, Indonesia, and Malaysia. Among his most notable achievements was the Mathematics in Context (MiC) curriculum project for middle schools, developed in collaboration with Tom Romberg at the University of Wisconsin–Madison and funded by the National Science Foundation. This initiative was foundational in promoting the RME

framework, which emphasized meaningful problem-solving grounded in real-world contexts. His efforts also led to the founding of the Freudenthal Institute USA in 2003, further extending his influence internationally.

JDL's contributions were equally impactful in the field of educational assessment. He played key roles in large-scale assessment programs, including the TIMSS, the National Assessment of Educational Progress (NAEP), and PISA. His expertise was widely recognized, leading to his involvement with the Mathematical Sciences Education Board (MSEB) of the U.S. National Research Council and his long-standing service as Secretary of the Commission Internationale pour l'Étude et l'Amélioration de l'Enseignement des Mathématiques (CIEAEM). He actively participated in and organized sessions at prominent conferences such as PME and ICME. Additionally, he contributed as a board member for several leading academic journals in mathematics education. Within the Netherlands, JDL spearheaded numerous national initiatives and served as a trusted advisor to governmental and educational institutions. He played a foundational role in establishing the A-lympiad and the annual National Mathematics Days, both of which remain influential in promoting mathematical problem-solving and teacher development. Observing his own children's development, he gradually shifted his research focus from curriculum design to the exploration of children's innate mathematical potential, becoming increasingly critical of traditional schooling, which he believed often suppressed natural intuition and curiosity.

The belief that curiosity is central to learning inspired JDL to initiate the TalentenKracht (Curious Minds) project in 2005. Under his leadership, this national initiative brought together six Dutch universities to explore how children's natural inquisitiveness could serve as a foundation for scientific and mathematical reasoning. Serving as project director from 2005 to 2010, de Lange championed the view that young learners should be treated as genuine researchers, capable of deep engagement with complex ideas. This project encapsulated his lifelong commitment to promoting creativity, autonomy, and joy in learning. Even after his formal retirement from Utrecht University in 2007—following a long and impactful career at the Freudenthal Institute—JDL remained actively involved in academic life. Notably, in 2019, he taught in the Utrecht Summer Schools as shown in Figure 4, delivering a session on Curious Minds and Serious Play. During this session, he shared a powerful message with participants: that any teaching method can be effective, as long as the teacher believes in it and is confident that it helps students understand mathematics meaningfully.

Figure 4. JDL with the participants of 2019 Utrecht Summer School for Mathematics Education from Indonesia

JDL's intellectual legacy in mathematics education is extensive and enduring. His work has shaped international discourse on curriculum design, assessment, and pedagogical innovation. Among his most influential contributions are his advocacy for contextualized learning and progressive mathematization (de Lange, 1987), the call for authentic and problem-centered assessment practices (de Lange, 1995), and the emphasis on applying mathematics in real-world contexts (de Lange, 1996). He also advanced the notion of quantitative literacy as essential for active citizenship (de Lange, 2003), promoted playful exploration as a serious path to deep understanding (de Lange, 2017), and argued against rigid design frameworks in favor of flexible, context-sensitive approaches (de Lange, 2021). Together, these contributions continue to inform research, influence policy, and inspire practice in mathematics education worldwide.

Mentorship and Influence on Academic Development

JDL's role as a mentor was characterized by his ability to inspire and challenge his students. His supervisory style was both rigorous and supportive, fostering an environment where intellectual curiosity was encouraged, and innovative thinking was rewarded. As a mentor, he was deeply invested in the success of his students, offering them not only academic guidance but also opportunities for professional growth. His encouragement to engage in international collaborations and participate in high-impact research projects significantly shaped my development as a researcher.

Many of his students and colleagues remember him not only for his academic rigor but also for his ability to create a collaborative and intellectually stimulating research culture. His leadership style promoted interdisciplinary work, ensuring that mathematics education remained dynamic and responsive to societal needs. His impact extended to various academic institutions and international organizations, where his methodologies and educational philosophies continue to influence teaching practices and policymaking.

Continuing Influence and Lasting Legacy

Following his retirement, JDL remained actively engaged in educational innovation, particularly through initiatives that embodied the spirit of the Curious Minds project. One such endeavor was the establishment of the Young Parents Academy, a program designed to support parents of young children (ages 3–7) in fostering cognitively rich parent–child interactions. Grounded in principles of holistic brain development and inspired by STEM education, this initiative encouraged parents to recognize and cultivate their children's natural talents through structured, inquiry-based activities. Central to this approach was the notion of "serious play," which JDL operationalized through interactive sessions across the Netherlands. These sessions provided hands-on experiences that revealed and nurtured children's emerging cognitive capacities. Often personally leading these workshops, he traveled extensively—his car filled with carefully curated educational materials—demonstrating his deep commitment to accessible, child-centered learning. The program not only influenced national educational discourse but also attracted international attention, leading to invitations for JDL to present his work to diverse audiences of educators, researchers, and policymakers.

Renowned as an inspiring and charismatic speaker, JDL was frequently invited to present at high-profile conferences such as ICME, PME, NCTM, AERA, and CIAEM, as well as by ministries of education and institutions in over 60 countries. His presentations, known for their originality, intellectual provocation, and humor, reflected his ability to bridge theory, policy, and practice in mathematics education. In addition to scholarly keynotes, JDL engaged in public science communication, delivering lectures on topics

ranging from STEM education and curiosity to mathematical reasoning and early childhood cognition. He frequently addressed audiences in informal venues—libraries, cafes, and public forums—underscoring his belief in making scientific knowledge accessible to all. His TEDxAmsterdamED talk in 2015, Curious Minds, Serious Play, exemplified this commitment and further cemented his role as an international advocate for inquiry-based learning (https://www.youtube.com/watch?v=M85fPO23CM8). His career was distinguished by numerous honors, including his appointment as Honorary Director of the Mathematics Education Research Institute at Central University, Beijing in 1994, and the prestigious ISDDE Prize for Design in Education in 2011. Through his prolific scholarship, visionary leadership, and mentorship, JDL left an indelible mark on the field of mathematics education. His passing represents a profound loss to the academic community; yet his intellectual legacy—defined by critical thinking, applied learning, and educational equity—continues to inspire and shape future generations of educators and researchers worldwide.

In Memory of Kees Hoogland (KH)

KH was a distinguished scholar and passionate advocate for mathematics and numeracy education. Until his final days, he remained deeply engaged in academic work, fully embodying his belief in the transformative power of numeracy for individuals and society. Despite a prolonged illness, he continued to contribute meaningfully to both national and international conversations on mathematics education, exemplifying unwavering commitment, intellectual rigor, and an enduring sense of humor. His sudden passing leaves a significant void in the field, but his legacy persists through the countless initiatives, publications, and lives he has touched.

Short Biography of Kees Hoogland (March 3, 1961 – June 14, 2025)

KH was born in Vlaardingen, the Netherlands, on 13 March 1961. A mathematician by training and educator by passion, he dedicated his life to enhancing mathematics education at all levels—from primary schools to adult learning environments. Throughout his multifaceted career, he held positions as lecturer, teacher educator, curriculum developer, consultant, project leader, and most recently, as professor of the research group Mathematical and Analytical Competence of Professionals at Hogeschool Utrecht (HU). He passed away peacefully on 14 June 2025 in Bussum, surrounded by his family, leaving behind an extensive body of work and a strong network of collaborators and followers worldwide.

Academic Background and Professional Trajectory

KH studied mathematics at Leiden University and began his career as a lecturer and teacher trainer at several Dutch institutions, including the Amsterdam University of Applied Sciences, Leiden University, and VU Amsterdam. His professional roles were diverse and included textbook authoring (notably for Moderne Wiskunde and ffLerenRekenen), in-service teacher training, international consulting, and executive leadership as CEO of the Algemeen Pedagogisch Studiecentrum (APS).

In 2020, he was appointed professor at Hogeschool Utrecht, leading the research group Mathematical and Analytical Competence of Professionals. His work focused on the role of numeracy in the daily lives of citizens and professionals, advocating for a perspective of "numeracy as social practice." He was also the project leader of the Erasmus+ initiative "Common European Numeracy Framework," aimed at defining numeracy as a 21st-century competence essential for all citizens.

Contributions to Mathematics Education

KH's scholarly and practical contributions to mathematics education were both expansive and deeply

influential, spanning theoretical innovation, policy development, and classroom practice. Central to his work was an unwavering advocacy for numeracy as a foundational competence vital to civic participation, social equity, and economic inclusion. He promoted a vision of numeracy not as a set of isolated arithmetic skills but as a form of social practice—deeply embedded in real-life contexts and essential for navigating the complexities of modern life (Hoogland & van Groenestijn, 2021). This perspective challenged traditional, decontextualized views of mathematics education by emphasizing the importance of engaging learners with meaningful, contextually relevant tasks. Drawing on the work of Díez-Palomar et al. (2023) and his own critical scholarship (Hoogland, 2023), KH argued for the integration of numeracy into broader societal discourses, calling for curriculum reforms that reflect the lived realities of learners.

In addition to his theoretical contributions, KH was a prolific author and an influential voice in educational publishing. His work appeared in a wide range of formats, including peer-reviewed journal articles, policy reports, blogs, and educational media. Notable among his publications is Images of Numeracy (Hoogland, 2016), which examined how visual representations can enhance problem-solving in authentic mathematical contexts. He also co-authored several important papers published in leading international journals such as ZDM – Mathematics Education (Hoogland & Tout, 2018; Boels et al., 2025) and Frontiers in Education (Hoogland, 2023; Díez-Palomar et al., 2023), reflecting his active engagement with global scholarly communities. His expertise extended to shaping national policy, most notably through his leadership in developing the NRO guideline Working on Arithmetic and Numeracy in Vocational Education (Hoogland et al., 2019), which exemplifies his guiding philosophy: “knowing what works and why.” This philosophy grounded his efforts to rethink and strengthen basic skills education across diverse educational sectors in the Netherlands and beyond.

KH’s contributions also had a significant international dimension, particularly through his involvement in the RME -inspired PMRI project. His participation in PMRI underscored his commitment to culturally responsive pedagogy and global capacity-building. In collaboration with Indonesian scholars, KH played an instrumental role in designing teacher education programs that embedded mathematical learning in everyday life contexts, thereby ensuring the relevance and sustainability of the reform (Sembiring et al., 2010). His mentorship of graduate students, particularly through master's and doctoral programs in partnership with Utrecht University, further extended his influence, cultivating a new generation of mathematics educators and researchers in Indonesia (Zulkardi et al., 2020). KH’s multifaceted work—grounded in theory, shaped by practice, and driven by a vision of educational justice—continues to resonate across both local and international contexts.

Continuing Influence and Lasting Legacy

Though KH’s life was cut short, the depth and breadth of his impact will endure. He leaves behind a comprehensive scholarly oeuvre, including foundational texts on numeracy and mathematics education reform, as well as practical guidelines for educators. His influence is visible in ongoing projects, such as the continuation of the PMRI initiative in Indonesia and the Erasmus+ Common European Numeracy Framework.

His research group at Hogeschool Utrecht has committed to continuing his work with the same passion and integrity that he embodied. Tributes from colleagues underscore his role not only as a rigorous academic but also as a mentor, strategic thinker, and communicator with an unrelenting belief in the power of education to democratize society. KH once stated that living meant "having a lionheart." His life and work testify to that courage and passion, inspiring future generations to reimagine mathematics and numeracy education not as isolated skills, but as integral to human agency and social

justice (https://www.internationalhu.com/research/researchers/kees-hoogland).

CONCLUSION

The enduring legacies of Professor Jan de Lange (JDL) and Professor Kees Hoogland (KH) represent more than individual accomplishments; they embody a collective vision for mathematics education that is inclusive, contextual, and transformative. Through their pioneering roles in the development and dissemination of RME and their leadership in international assessment frameworks such as PISA and TIMSS, both scholars have left an indelible mark on global educational discourse. In Indonesia, their impact has been especially profound, catalyzing the emergence of the PMRI movement and fostering long-term academic collaborations that have redefined mathematics teaching and learning. Their work exemplifies the power of transnational academic exchange, mentorship, and sustained institutional partnerships in shaping educational reform that is both culturally responsive and pedagogically innovative.

This narrative account highlights the human dimensions behind systemic change—tracing how JDL's visionary leadership, international outreach, and mentorship nurtured a generation of scholars, and how KH's emphasis on numeracy as a social practice reframed mathematical competence as essential for equity and civic engagement. Their contributions continue to reverberate in classrooms, curricula, and communities, both in the Netherlands and internationally. As education systems around the world grapple with increasing complexity and diversity, the legacies of JDL and KH offer a compelling model for future reform: one rooted in curiosity, collaboration, and a commitment to meaningful learning. By documenting their academic journeys and honoring their intellectual generosity, this study not only preserves their memory but also invites current and future educators to carry forward their mission of mathematics education as a vehicle for human development and social justice.

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