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Analysis of Age and Gender in the Development of Mathematics Confidence Among Lower Primary Pupils

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ABSTRACT

This article examines the relationships among mathematics confidence, fear of mathematics, age, and gender in lower primary pupils (Primary 2) at Dadira Primary School in Uganda following an eight-week play-based mathematics intervention. A sample of 40 pupils, equally distributed by gender, participated in pretest and posttest assessments of mathematics confidence and fear. Results showed no significant age or gender differences at baseline. A mixed-design ANOVA revealed a substantial increase in mathematics confidence from pretest to posttest, with mean scores rising from 23.50 to 34.00, representing an average gain of 10.50 points. The improvement was statistically significant and similar for both boys and girls. Fear of mathematics also decreased significantly following the intervention. Boys' fear scores declined by an average of 8.50 points, while girls' scores decreased by 7.40 points, although the difference between genders was not statistically significant. Further analyses indicated that neither age nor gender significantly predicted posttest mathematics confidence or fear of mathematics. The findings suggest that play-based, confidence-building instructional approaches can effectively improve young learners' attitudes toward mathematics regardless of age or gender. The study highlights the importance of introducing anxiety-reduction and confidence-enhancing strategies during the early years of schooling before gender-based differences in mathematics engagement emerge.

Keywords: Anxiety, *Confidence, Early Childhood Education, Pupils, Gender, Age, Mathematics.*

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1. INTRODUCTION

1.1. Background

Uganda's education system requires learners to spend seven years in primary school (Primary One to Primary Seven) before proceeding to secondary education. Primary schooling is further divided into a lower primary section (Primary One to Primary Three), during which foundational literacy and numeracy skills are established, and an upper primary section (Primary Four to Primary Seven), which culminates in the Primary Leaving Examination administered by the Uganda National Examination Board (UNEB) (Uganda Bureau of Statistics [UBOS], 2017). Mathematics is a compulsory, examinable subject throughout primary school, and the attitudes that pupils form toward the subject during the lower primary years have been shown to shape their confidence and performance well into upper primary and secondary school (Danili & Reid, 2006; Aunio & Räsänen, 2016). Despite the importance of these early years, most existing literature on mathematics anxiety and confidence in Uganda and elsewhere concentrates on secondary and tertiary learners, leaving the lower primary years comparatively under-researched.

Poor performance in mathematics-related tasks can be attributed to feelings of inadequacy coupled with diminished self-efficacy that, left unaddressed, tend to compound as a child advances through school (Cannady, Greenwald & Harris, 2014). Gal and Ginsburg (1994) assert that a strong early grasp of mathematics plays a critical role in a child's broader academic development, since numerical reasoning underlies many other areas of the curriculum. Consequently, educators have made attempts to help young learners overcome mathematics anxiety before it becomes entrenched (Gal & Ginsburg, 1994). Contemporary studies, such as Domino (2009), recommend that educators pay greater attention to variables such as the use of diagrams, play, and the encouragement of questions to achieve positive outcomes in mathematics instruction, particularly among younger learners. That said, Kiwanuka et al. (2015) point out that the effectiveness of fear-elimination strategies is not guaranteed and remains an open empirical question, especially outside the contexts in which such strategies were originally studied.

In Uganda, a considerable proportion of lower primary pupils appear to struggle to build confidence in mathematics from an early age, a pattern that later manifests in the gender and performance disparities documented at secondary and tertiary level (UBOS, 2017). Available literature mostly focuses on structural aspects of this problem, such as teacher shortages, inadequate parental and teacher support, and scarce teaching materials, or on perceptions of mathematics as an inherently difficult subject (Tembe & Norton, 2011). Devine et al. (2012) conducted comparable research in the United Kingdom, a setting that differs from Uganda in terms of access to facilities and the language of instruction; in Uganda, English becomes the official language of instruction from Primary Four, while lower primary instruction is typically delivered in the local language (Tembe & Norton, 2011). Replicating studies such as Devine et al. (2012) in the Ugandan lower primary context could reveal different patterns, since comprehension may be affected by mother-tongue interference and by gendered expectations that begin at home (Rwomire, 2001). Most of the existing research on this question comes from developed countries with more established traditions of gender-equitable education; no comparable study has examined whether gender and age already shape mathematics confidence and fear among lower primary pupils in Uganda.

Dadira Primary School, in Busia District, was purposively selected for this study because its Primary Two numeracy performance records over the two preceding academic years were below the sub-county average, and because the school's administration was willing to accommodate a structured, teacher-delivered intervention within the normal class timetable, making it both a feasible and a policy-relevant site for investigating whether mathematics confidence can be built among young learners, and whether age and gender shape that process. This research fills a gap in the literature by examining whether age and gender, two variables most strongly implicated in mathematics anxiety among older learners, are also influential among lower primary pupils in Uganda.

This article examines how age, gender, and fear of mathematics are linked among lower primary pupils who undergo a mathematics confidence-building intervention. The specific objectives are; (i) to determine whether there is a significant difference between pretest and posttest mathematics confidence based on pupils' gender; (ii) to determine whether there is a significant difference between pretest and posttest fear of mathematics based on pupils' gender; (iii) to establish whether age and gender predict mathematics confidence among pupils; (iv) to establish whether age and gender predict fear of mathematics among pupils.

1.2. Research Hypotheses

The following hypotheses were derived from the research objectives above.

H01: There is no significant difference between pretest and posttest mathematics confidence based on pupils' gender.

H02: There is no significant difference between pretest and posttest fear of mathematics based on pupils' gender.

H03: Age and gender do not predict mathematics confidence among pupils.

H04: Age and gender do not predict fear of mathematics among pupils.

2. LITERATURE REVIEW

A reduced desire to engage with mathematics among young learners is linked to inadequate support from educators and parents in solving mathematical problems at school and at home. This low level of assistance contributes to a lack of confidence in the subject. Kiwanuka et al. (2015) contend that parental support for mathematics learning includes paying for extra coaching, purchasing relevant learning materials, and providing verbal encouragement.

Several studies have examined whether gender is a significant factor influencing mathematics performance among Ugandan learners, including at the primary level. Nannyonjo (2007), studying grade-six pupils in Uganda, found that boys taught mathematics by male teachers scored higher on average than girls taught by male teachers (31.06 versus 26.57, respectively), while girls taught by female teachers scored marginally higher than boys taught by female teachers, though the difference was not significant (27.51 versus 27.43). The teacher's gender therefore appeared to interact with pupil gender in shaping outcomes, even at the primary level.

The Uganda Bureau of Statistics (2017) has separately reported persistent gender disparities in enrolment and progression along mathematics-related pathways as learners advance through the education system, with the gap most pronounced at the secondary and tertiary levels. Because such disparities are typically documented only from secondary school onward, it remains an open question whether comparable gender differences in confidence or fear in mathematics are already detectable in the lower primary years, or whether they emerge later. Uganda's official primary school entry age is six years, which means that pupils in the lower primary section (Primary One to Primary Three) are typically between six and nine years old (UBOS, 2017). Age-related differences in mathematics performance have been documented among older learners in Uganda (Ayotola & Adedeji, 2009), but it is unclear whether such differences are already present among six- to nine-year-olds, whose mathematical skills are still at a formative stage.

Cognition refers to the attributes and disposition of an individual that shape performance and learning. Danili and Reid (2006) note that cognition comprises attitude, interest, fear, numerical reasoning, confidence, memory, and attention. A study conducted in Uganda by Nsubuga (2015) concurred with Domino (2009) that mathematics achievement depends substantially on a learner's attitude, confidence, and interest. Furedi (2006) associates fear with the anticipation of threats in unspecified situations and with a reduced sense of personal control over future events; such feelings are typically unpleasant and prompt avoidance. Onwuegbuzie and Wilson (2003) associate fear of mathematics with anxieties over specific components of the subject, including reading, learning, critical thinking, and testing. According to Williams (2010), anxiety is negatively correlated with enjoyment and the value a learner ascribes to the subject, for some learners, this manifests as a fear of failure. In young children, fearful reactions can appear as reluctance to attempt number problems, avoidance of counting tasks, or visible distress during timed exercises.

Fear of mathematics that originates in the early years of schooling, if left unaddressed, tends to persist into upper primary, secondary, and even tertiary education (Williams, 2010). Sutter (2006) contends that fear of mathematics extends beyond mathematical thinking to encompass a broader negative attitude toward the subject. Negative beliefs associated with mathematics anxiety include frustration, worry, and avoidance (Furner & Duffy, 2002). Cohen (2013) argues that mathematics ability influences a learner's performance in other subjects that involve data and numerical reasoning. Because early fear of mathematics can compound over a child's schooling career, addressing it during the lower primary years, when attitudes are still forming, may be more effective than waiting until secondary school.

The underpinning models for this research are the leaky-pipeline model, mindset theory, and constructivist theory. The leaky-pipeline model describes a progressive loss of interest in science, technology, engineering, and mathematics (STEM) subjects as learners advance through school and into their careers, with female continuation in mathematics and related subjects declining most steeply (Jacobs et al., 2005). Jacobs et al. (2005) argue that this reduced interest among girls, despite comparable or superior early ability relative to boys, is associated with childrearing expectations and gender stereotypes that begin to operate from an early age. In Uganda, girls are often encouraged toward home-making responsibilities as they grow older (Rwomire, 2001), a pattern that, if it originates in early childhood, would imply that attitudes toward mathematics could begin to diverge by gender well before secondary school. By contrast, boys are stereotypically encouraged toward STEM fields because they are more readily viewed by society as capable mathematicians and scientists (Cannady, Greenwald & Harris, 2014). Because these gendered patterns are thought to widen over time, examining whether a gender gap in mathematics confidence is already detectable among six- to nine-year-old pupils is directly relevant to understanding when, and how early, such patterns take hold.

Constructivist theory, meanwhile, is particularly well suited to lower primary mathematics instruction. The theory holds that learners construct their own understanding of mathematical concepts through active engagement rather than passive transmission of knowledge (Dweck, 2017). This is consistent with Piaget's (1952) account of cognitive development, in which children aged approximately 6 to 9 years are transitioning from pre-operational to concrete-operational thought and rely heavily on concrete, hands-on activities to build abstract understanding. The constructivist emphasis on creating situations that favour learners' own mental construction of mathematical ideas, rather than on lecturing, therefore underpins the design of the play-based intervention used in this study.

2. METHODS

2.1. Research Design

This article used a pretest-posttest experimental design on primary data to examine changes in mathematics confidence and fear of mathematics among pupils before and after exposure to a structured confidence-building intervention. Confidence in, and fear of, mathematics served as the dependent variables, while age and gender were the independent variables.

2.2. Population and Sampling

The target population comprised Primary Two pupils at Dadira Primary School, Busia, Uganda, drawn from a stream of 120 pupils (63 boys and 57 girls). Primary Two was targeted because it is the class in which pupils consolidate early number sense into formal numeracy operations, a transition that has previously been associated with heightened mathematics-related apprehension among young learners (Aunio & Räsänen, 2016).

A systematic random sampling procedure, rather than simple random or stratified sampling, was used to draw the study sample, since a fixed sampling interval was applied to an ordered list. The class register (N = 120) served as the sampling frame. With a desired sample of 40 pupils, a sampling interval of k = 3 was calculated (120 ÷ 40 = 3). A random starting point between 1 and 3 was selected using a table of random numbers, and thereafter every third pupil on the register was selected until a sample of 40 pupils (20 boys and 20 girls) was obtained. Sampling was conducted using the full class register during a normal school term, rather than during remedial holiday tuition for weaker pupils as in an earlier round of data collection, so that the sample reflects the full range of mathematics ability in the class rather than being skewed toward lower-performing pupils. The age of respondents ranged from 6 to 9 years. Owing to the relatively small size of the target population, a design effect of 1.5 was applied when calculating the minimum required sample size, using the formula of Fisher et al. (1998):

$$n = (Z^2 \times p \times (1 - p) \times Deff) / d^2$$

where Z is the standard normal deviate at 95% confidence (1.96), p is the estimated proportion of pupils with low mathematics confidence (set conservatively at 0.5), Deff is the design effect (1.5), and d is the desired margin of error (0.15). This formula yielded a minimum required sample of 35 pupils; a final sample of 40 pupils was retained to guard against attrition. Each pupil's confidence in and fear of mathematics were assessed at pretest and again at posttest following the intervention, using the instruments described below.

2.3. Instruments and Data Analysis

A 15-item, three-point pictorial Mathematics Confidence Scale (happy face = confident, neutral face = unsure, sad face = not confident; scored 1–3) was used to measure pupils' confidence in mathematics, giving a possible score range of 15–45, with higher scores indicating greater confidence. A parallel 15-item, three-point pictorial Mathematics Fear Scale, adapted for lower primary pupils from the principles of the Mathematics Anxiety Rating Scale described by Zeidner (1991) but simplified in wording and response format, was used to measure fear of mathematics, also on a range of 15–45, with higher scores indicating greater fear. Both instruments were read aloud item-by-item by the class teacher in the pupils' first language, consistent with recommended practice for lower primary assessment in Uganda (Tembe & Norton, 2011), and pupils indicated their response by pointing to the appropriate face. A pilot administration with 15 pupils from a comparable class (not part of the study sample) indicated acceptable internal consistency for both instruments (Cronbach's alpha = .78 for the Confidence Scale and .81 for the Fear Scale).

Because gender is a nominal-scale variable, independent-samples t-tests, rather than analysis of variance or multiple regression, were used to compare boys' and girls' scores at pretest and again at posttest. To evaluate whether the pretest-to-posttest change in confidence differed by gender (Objective i), a 2 (gender: boy, girl) × 2 (time: pretest, posttest) mixed-design analysis of variance was conducted, with gender as the between-subjects factor and time as the within-subjects (repeated-measures) factor, and gain scores (posttest minus pretest) were additionally compared between genders using an independent-samples t-test to establish which gender benefited more from the intervention. For fear of mathematics (Objective ii), independent-samples t-tests were used to compare boys and girls at pretest and again at posttest, and paired-samples t-tests, together with a comparison of gain scores between genders, were used to establish which gender benefited more. To establish whether gender predicted posttest confidence and fear of mathematics (Objectives iii and iv), independent-samples t-tests were used because gender is categorical; to establish whether age predicted posttest confidence and fear of mathematics, simple linear regression was used because age is continuous.

2.4. The Play-Based Mathematics Confidence Programme

Cognitive-behavioural therapy is a structured, typically individually delivered clinical intervention administered by a trained therapist, and it was not an accurate description of the classroom-based, group-delivered activity used in this study. The intervention was instead an eight-module, group-based Play-Based Mathematics Confidence Programme (PMCP), developed by the researchers in consultation with the class teacher and delivered by the class teacher to the whole class (including non-participating pupils, so as not to disadvantage them) over eight consecutive weeks, in one 40-

minute session per week held during the normal mathematics period. Each module followed a standardised lesson script prepared in advance by the researchers to ensure consistent delivery, and the class teacher received a half-day orientation on the script and materials before the programme began.

The eight modules were: (1) number games using locally available counting objects such as bottle tops and stones; (2) paired peer-buddy problem-solving; (3) picture-and-story mathematics problems; (4) small-group (four-pupil) collaborative tasks in which each group was assigned a different question related to the day's topic; (5) use of drawings and diagrams to represent number problems; (6) guided question-asking practice, in which pupils were prompted and praised for asking questions during the lesson; (7) group presentation of solutions to the class, with teacher-guided correction of errors; and (8) a consolidation module combining games, drawings, and group work drawn from the preceding modules. The posttest was administered during the week following the eighth module.

2.5. Ethical Consideration

Because participants were minors, written informed consent was obtained from each pupil's parent or guardian prior to recruitment, and verbal assent was additionally sought from each pupil in a language they understood. Pupils were assured that their responses would remain private and would not affect their school marks. The pretest and posttest questionnaires were administered in the pupils' own classroom during the normal school day, under the supervision of the class teacher and a research assistant, so as to hold the physical environment, time of day, and administering adults constant across the two testing occasions and thereby limit the influence of extraneous variables on the pretest–posttest comparison. Completed questionnaires were sealed in individually labelled envelopes and kept in a locked cabinet in the head teacher's office between the pretest and posttest administrations to preserve confidentiality.

3. RESULTS

3.1. Descriptive Results

Table 1 shows that the sample was evenly split by gender (20 boys, 20 girls). The mean age of boys ($M = 7.35$, $SD = 0.88$) was marginally higher than that of girls ($M = 7.15$, $SD = 0.99$); an independent-samples t-test confirmed that this difference was not statistically significant, $t(38) = 0.68$, $p = .502$. Because each gender was equally represented, and the sample was drawn to reflect the full range of mathematics ability in the class rather than being restricted to weaker pupils, the results below are unlikely to be distorted by sample composition.

Table 1:

Age of Respondents by Gender

Gender	n	M	SD	SE
Boys	20	7.35	0.88	0.20
Girls	20	7.15	0.99	0.22
Total	40	7.25	0.93	0.15

Note. $t(38) = 0.68$, $p = .502$.

3.2. Empirical Results

3.2.1. Difference in Mathematics Confidence Between Pretest and Posttest, by Gender

Research question one aimed at establishing whether the pretest-to-posttest change in mathematics confidence differed by gender. Table 2 presents descriptive statistics for confidence at pretest and posttest by gender, and Table 3 presents the results of the 2 (gender) × 2 (time) mixed analysis of variance.

Table 2:
Descriptive Statistics for Mathematics Confidence by Gender and Time

Time	Gender	n	M	SD
Pretest	Boys	20	23.85	4.46
	Girls	20	23.15	5.47
Posttest	Boys	20	34.20	4.84
	Girls	20	33.80	6.88

Table 3:
Mixed (Gender × Time) Analysis of Variance for Mathematics Confidence

Source	SS	df	MS	F	p
Gender	3.03	1	3.03	0.11	.744
Error (Gender)	1063.35	38	27.98		
Time	2205.63	1	2205.63	482.80	< .001
Error (Time)	173.60	38	4.57		
Gender × Time	0.45	1	0.45	0.10	.755

The main effect of time was significant, $F(1, 38) = 482.80$, $p < .001$, indicating that pupils' confidence increased substantially between pretest ($M = 23.50$, $SD = 4.95$) and posttest ($M = 34.00$, $SD = 5.84$), an average gain of 10.50 points. The main effect of gender was not significant, $F(1, 38) = 0.11$, $p = .744$, and the gender × time interaction was also not significant, $F(1, 38) = 0.10$, $p = .755$, indicating that boys and girls benefited similarly from the intervention. This is reinforced by the gain scores: boys gained an average of 10.35 points ($SD = 2.58$), and girls gained an average of 10.65 points ($SD = 3.41$); an independent-samples t-test confirmed that this small difference in gain was not statistically significant, $t(38) = -0.31$, $p = .755$. We therefore fail to reject H01 and conclude that there is no statistically significant difference between boys and girls in the pretest-to-posttest change in mathematics confidence, although both genders showed a large, statistically significant improvement in confidence following the intervention.

3.2.1. Difference in Fear of Mathematics Between Pretest and Posttest, by Gender

The second research question examined whether the pretest-to-posttest change in fear of mathematics differed by gender. Table 4 presents descriptive statistics, and Table 5 presents independent-samples t-test results comparing boys and girls at pretest and at posttest.

Table 4:
Descriptive Statistics for Fear of Mathematics by Gender and Time

Time	Gender	n	M	SD
Pretest	Boys	20	28.80	7.13
	Girls	20	30.75	5.43
Posttest	Boys	20	20.30	6.24
	Girls	20	23.35	6.36

Table 5:
Independent-Samples t-Test for Fear of Mathematics by Gender

Time	t	df	p	d
Pretest	-0.97	38	.337	-0.31
Posttest	-1.53	38	.134	-0.48

At pretest, boys and girls did not differ significantly in fear of mathematics, $t(38) = -0.97$, $p = .337$, $d = -0.31$. At posttest, boys reported somewhat lower fear than girls, but the difference did not reach statistical significance, $t(38) = -1.53$, $p = .134$, $d = -0.48$. Paired-samples t-tests showed that both boys, $t(19) = 14.70$, $p < .001$, and girls, $t(19) = 12.52$, $p < .001$, registered a significant reduction in fear of mathematics from pretest to posttest. Boys' fear dropped by an average of 8.50 points ($SD = 2.59$) and girls' fear dropped by an average of 7.40 points ($SD = 2.64$); an independent-samples t-test comparing these gains showed no statistically significant gender difference, t(38) = 1.33, p = .191, indicating that although boys showed a numerically larger reduction in fear, both genders benefited from the intervention to a statistically comparable degree. We therefore fail to reject H02.

Because gender is a nominal-scale variable, an independent-samples t-test rather than a regression coefficient was used to test whether gender predicted posttest confidence; as reported above, gender did not predict posttest confidence, t(38) = 0.21, p = .833, d = 0.07. Age, a continuous variable, was tested using simple linear regression with posttest confidence as the outcome. The model was not statistically significant, R^2 = .008, F(1, 38) = 0.31, p = .583, b = −0.57, SE = 1.02, t(38) = −0.55, p = .583, indicating that age did not predict posttest confidence. We therefore fail to reject H03 and conclude that neither age nor gender predicts mathematics confidence among pupils of Dadira Primary School.

Gender was again tested using an independent-samples t-test: t(38) = −1.53, p = .134, d = −0.48; gender did not predict posttest fear of mathematics. Age was tested using simple linear regression with posttest fear of mathematics as the outcome. The model was not statistically significant, R^2 = .000, F(1, 38) = 0.02, p = .900, b = 0.14, SE = 1.12, t(38) = 0.13, p = .900, indicating that age did not predict posttest fear of mathematics. We therefore fail to reject H04.

4. DISCUSSION

Taken together, the analyses indicate that confidence in mathematics and fear of mathematics were broadly uniform across gender and age among the lower primary pupils sampled at Dadira Primary School, even though both boys and girls showed substantial, statistically significant gains in confidence and reductions in fear following the eight-week play-based intervention. In other words, pupils of different ages and genders exhibited similar levels of confidence and fear and responded comparably to the intervention. Furner and Duffy (2002) recommend encouraging learners to voice their concerns and suggest ways of coping with mathematics anxiety, and the guided question-asking module of the PMCP drew directly on this recommendation. Kher, Molstad and Donahue (1999) endorse the use of images, such as pictures and diagrams, to reduce tension and improve learning; several PMCP modules incorporated drawings and picture-based problems for this reason. Nsubuga (2015) similarly recommends that educators cultivate interpersonal sensitivity to learners' worries and encourage and reassure pupils about their abilities, a principle reflected in the class teacher's guided, non-punitive correction of errors during group presentations.

The finding that confidence and fear did not vary significantly by age or gender is consistent with Devine et al. (2012), who reported similarly uniform patterns among British learners. It differs, however, from Rodarte-Luna and Sherry (2008), who found that anxiety-provoking stimuli affected learners of different genders differently. In the present study, boys and girls exhibited broadly similar levels of fear and responded to the intervention to a statistically comparable degree at this early stage of schooling. Because gendered patterns in mathematics engagement are thought to widen as learners progress through school (Jacobs et al., 2005), the absence of a detectable gender gap among six- to nine-year-olds, together with the comparable benefit both boys and girls derived from the PMCP, suggests that the lower primary years may be a particularly opportune stage at which to introduce confidence-building activities, before such gaps have the opportunity to emerge. This implies that educators should not withhold or selectively target fear-mitigation strategies by pupil gender or age at the lower primary level, since the evidence here suggests that all young learners can benefit.

5. CONCLUSION

The primary goal of this article was to investigate the relationships among fear of mathematics, age, and gender in lower primary school pupils. Existing literature on mathematics anxiety and confidence focuses mainly on secondary and tertiary learners, and comparatively little attention has been paid to how these variables operate among younger children in the early years of formal schooling, when foundational attitudes toward mathematics first begin to form. This study tests whether findings established among older learners elsewhere are comparable to the experiences of lower primary pupils in Uganda.

The findings establish that there are no statistically significant differences in mathematics confidence or fear of mathematics by gender or age, although both boys and girls showed large, statistically significant gains in confidence and reductions in fear of mathematics following the intervention. Neither age nor gender predicted confidence or fear of mathematics. The study suggests that confidence-building strategies recommended by previous scholars for older learners are equally applicable to lower primary pupils in Uganda, regardless of age or gender, and that these strategies may be most valuable when introduced early in a child's schooling.

This study has some limitations. It was conducted as a single-school case study, which limits the generalisability of its findings to other lower primary contexts in Uganda. The sample of 40 pupils, though adequate for the statistical tests used, was modest, and the absence of a no-treatment comparison class means that the observed gains cannot be attributed to the PMCP alone, as opposed to maturation, repeated testing, or other classroom events occurring over the eight-week period. Future research should replicate this design across multiple schools and include a control group that does not receive the intervention to more confidently attribute observed changes in confidence and fear of mathematics to the programme itself.

DECLARATION

Conflict of interest

The author declares no conflict of interest of any form regarding this work, and is, thus, his (own) original work done independently.

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