STUDENTS' MATHEMATICAL WELLBEING: FEELING GOOD, FUNCTIONING WELL, OR BOTH?

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Student wellbeing encompasses both hedonic (feeling good) and eudaimonic (functioning well) aspects, yet how students articulate these dimensions in mathematics remains underexplored. Drawing on survey responses from 1,192 students, this study examines the extent to which students mention hedonic, eudaimonic, or both aspects when describing their mathematical wellbeing. Findings showed 61% mentioned eudaimonic-only, 36% mentioned both, and 3% mentioned hedonic-only. Among those describing both, 542 described functioning before feeling, whereas only 41 described the reverse. This suggests positive emotions are experienced alongside successful functioning—particularly through relationships and accomplishment—highlighting the importance of supporting students to function well in mathematics.

INTRODUCTION

For many students, mathematics evokes strong emotional (e.g., anxieties) and behavioural (e.g., avoidance, disengagement) responses. International studies show that mathematics anxiety has increased from 31% in 2012 to 39% in 2022 (OECD, 2024), while the TIMSS 2019 study reported that 20% of fourth graders and 41% of eighth graders dislike mathematics (Mullis et al., 2020). Many students capable of advanced mathematics disengage, not due to cognitive limitations, but due to wellbeing-depleting classroom experiences characterised by a lack of belonging, meaning, and enjoyment (Hunter & Hill, 2025). These indicators suggest that a significant portion of students experience low wellbeing in mathematics.

To counteract the deficit-oriented focus on affective, cognitive, and behavioural challenges in mathematics education, Hill (2024) developed a framework of mathematical wellbeing (MWB) that foregrounds students' strengths rather than their problems or weaknesses. MWB is defined as the extent to which students fulfil their core values through the mathematics learning process, accompanied by positive feelings (e.g., enjoyment) and functioning (e.g., engagement, belonging). Within this framework, feeling good (i.e., hedonic wellbeing) and functioning well (i.e., eudemonic wellbeing) are both important indicators of MWB, adapted from other more general wellbeing models from positive psychology (e.g., Huppert & So, 2013; Ryff & Singer, 2008) which we focus on in this study.

A growing number of studies have explored student MWB using Hill et al.'s (2021; 2022) framework. By incorporating both hedonic and eudaimonic dimensions of wellbeing, MWB conceptualises wellbeing as a multidimensional construct (outlined

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in greater detail below). However, no studies to date have explicitly quantified or unpacked the hedonic and eudaimonic aspects of students' mathematical experiences to determine whether one aspect predominates over the other. Understanding how students articulate hedonic and eudaimonic wellbeing in mathematics is important because wellbeing research conceptualises these as correlated yet distinct constructs, each serving different roles and contributing to overall wellbeing (Ryan & Deci, 2001). This suggests that higher levels of wellbeing are more likely when individuals experience both hedonic and eudaimonic aspects together, rather than in isolation (Huta & Ryan, 2010). Applied to the mathematics classroom, students who experience both positive feelings (i.e., hedonia) and optimal functioning (i.e., eudemonia) would likely experience higher MWB than those who experience only one dimension. Moreover, understanding whether students typically experience these dimensions simultaneously or sequentially—and if sequentially, in what order—has important implications for how educators can best support MWB. For example, if functioning typically precedes positive emotions, this suggests that creating conditions for successful functioning may be a primary pathway to supporting students' overall MWB.

This study addresses the need for a more detailed investigation of hedonic and eudaimonic wellbeing within mathematics education. Specifically, we examine the frequency with which students mention hedonic and eudaimonic aspects when describing their MWB, as well as how students describe the relationship between these dimensions when both aspects are mentioned together. The research question guiding this study is*: To what extent do students mention factors related to feeling good, functioning well, or both, when describing their mathematical wellbeing? When students mention both, in what sequence are these dimensions described?*

THEORETICAL BACKGROUND

The MWB framework was developed through a systematic review of the mathematics education values literature (Hill et al., 2022) and empirical studies across several countries (e.g., Hill et al., 2021; Hunter & Hill, 2025). This synthesis identified seven core values students describe as important for their MWB: accomplishment, cognitions, engagement, meaning, perseverance, positive emotions, and relationships. These values can be understood through the lens of hedonic wellbeing (i.e., feeling good) and eudaimonic wellbeing (i.e., functioning well).

Hedonic wellbeing relates to pleasant feelings and evaluations—what Huppert and So (2013) describe as "feeling good" (p. 838). In mathematics education, hedonic wellbeing includes positive emotions such as enjoyment and fun during lessons, pride in one's mathematical work, feeling safe and relaxed in the classroom, and the absence of anxiety-triggering situations (Hill, 2024).

Eudaimonic wellbeing runs deeper than fleeting emotions, relating to more lasting and meaningful experiences. Rooted in Aristotelian accounts of optimal functioning, eudaimonic wellbeing has been operationalised in educational research through

constructs related to purpose, personal growth, mastery, and positive relations (Ryff & Singer, 2008). In mathematics, eudaimonic aspects include accomplishment experiences such as accuracy and reaching goals; cognitive engagement through problem solving, understanding, and reasoning; meaningful connections between mathematics and real-world problems; perseverance through sustained effort; and supportive relationships with teachers and peers (Hill, 2024).

Whilst hedonic and eudaimonic aspects of MWB have been explored in previous studies (e.g., Campbell & Bean, 2025; Hunter & Hill, 2025), they have not been separated or quantified into these two discrete categories, nor has research examined when students articulate both aspects together and for what reasons. This study addresses this gap by analysing how students describe their MWB in terms of hedonic and eudaimonic dimensions.

METHODS

In total, 1192 students across 115 schools (Grades 3–10) in New Zealand responded to an online survey question: *What makes you feel really good and function well when you are learning mathematics? Why does this make you feel really good and function well?* Responses were imported into NVivo 15 and analysed using a purely deductive thematic strategy. First, student responses were coded using an existing framework of over 90 codes developed through prior empirical research (Hill, 2024). For example, as shown in Table 1, the response “I feel good in maths because it's fun for kids” was coded as *enjoyment & fun*. Second, these codes were deductively categorised as either hedonic or eudaimonic based on established distinctions from positive psychology. Hedonic codes captured pleasurable feelings such as fun, enjoyment, love, and hope, while eudaimonic codes aligned with optimal functioning constructs, including accomplishment, meaning, relationships, cognitions, engagement, and perseverance. The frequency of each code was then calculated.

Third, responses were categorised according to whether students referred to hedonic wellbeing only, eudaimonic wellbeing only, or both hedonic and eudaimonic wellbeing together (see Table 1). Within the “both” category, responses were further examined for the relative ordering or separation of feeling and functioning to identify patterns in how students articulated the relationship between these two dimensions.

RESULTS AND DISCUSSION

Students mostly referred to eudaimonic-only aspects of MWB (61%), followed by accounts that mentioned both hedonic and eudaimonic aspects (36%), with only a small proportion referring exclusively to hedonic experiences (3%). Table 1 presents the analytic categories, codes, frequencies, and illustrative student quotes.

Hedonic only – “feeling good”

The hedonic-only responses comprised six codes, with enjoyment and fun being most common (n = 21), followed by expressions of love for mathematics (n = 11). Fewer students described emotion regulation (n = 3), confidence (n = 3), positive mindset (n

= 2), and feeling safe and relaxed (*n* = 1). The relatively small proportion of hedonic-only responses suggests that when describing their MWB, students rarely articulate positive feelings independently from functioning experiences. This pattern may reflect mathematics education's emphasis on performance and achievement rather than emotional experiences (Hill, 2024), where students may learn to prioritise functioning when making sense of their mathematical experiences.

Table 1. Coding strategy and illustration of student quotes

Theme	Codes	#	Illustrative quotes
Hedonic only	Enjoyment & fun	21	I feel good in maths because it's fun for kids.
	Love	11	Yes, I love maths. I feel great doing maths.
	Emotion regulation	3	It's not so loud, so I can control my emotions.
	Confidence	3	Confident thinking, because it makes me feel like I can do it.
	Positive mindset	2	A positive mind.
	Safe & relaxing	1	Music. It just makes me relaxed and feel at home.
Eudemonic only	Relationships	438	Having group members to help me with the task. They can help on hard tasks that I can't solve myself.
	Cognitions	263	When I can solve a problem, I have learned a lot, and I know how to do it.
	Accomplishment	132	The thing that makes me good at maths is that I am really talented at timetables and quick at answering questions.
	Engagement	120	To do good in maths, I try to focus on the question.
	Perseverance	65	My effort and energy, time and practise. Because it helps me learn more.
	Meaning	9	I think I can learn and it will help me in life.
Both	Eudaimonic → Hedonic	542	When I get it right or have tried my hardest or done lots of work, especially when I am with some of my friends, I feel very accomplished and proud of myself.
	Hedonic → Eudaimonic	41	Sometimes I'm good at maths because I enjoy it, and if I enjoy it, I practise it.
	No clear ordering	21	I enjoy maths, and I can always get help if I need it, because there is lots of support and maths is easy.
	Mixed (negative & positive)	6	I feel really good in maths because maths makes me feel like I can do anything. I'm not that good at maths, but I can do things if I have my own space.

Eudaimonic only – "functioning well"

Eudaimonic-only responses comprised six codes. Positive relationships were mentioned most frequently (*n* = 438), and mostly in relation to collaborative group learning (*n* = 137), support from friends (*n* = 102), and teacher support (*n* = 49). For example, students stated: "Working together in a group, because it's better, the questions are easier" and "Working with the right people and having a good teacher, because if I get stumped, I know there are people to help me." This prominence of relationships aligns with research showing that students place greater importance on relationships than on other aspects of their MWB (Hill et al., 2024). This relational emphasis may be particularly salient in the New Zealand context, where collective orientations are valued among Māori and Pacific mathematics learners (Hunter & Hill, 2025).

Other codes, including cognitions (*n* = 263) and accomplishment (*n* = 132), were also prominent, with students referring to problem-solving (*n* = 61), understanding (*n* = 57), and accuracy *(n* = 64) as indicators of functioning well.

Both hedonic and eudaimonic – "feeling good and functioning well"

Given that students are most likely to experience wellbeing when both eudaimonic and hedonic (Huppert & So, 2013) are experienced together, we focus mostly on this theme. Among the 610 responses mentioning both hedonia and eudemonia, a notable asymmetry emerged: 542 described functioning well before feeling good, whereas only 41 described the reverse pattern. Because these are students' written accounts describing what makes them feel good and function well, the ordering of content within their responses may suggest the sequence in which they experienced these dimensions. For example, when a student writes "When I get it right...I feel very accomplished and proud," the accomplishment appears to precede the feeling of pride. We therefore conjecture that, for many students, optimal functioning may precede positive emotions. However, given the cross-sectional nature of this data, we cannot establish causal relationships.

For students who described functioning before feeling, the most frequent pattern involved cooperation and enjoyment (*n* = 87), exemplified by a student stating: "I feel really good when I work with other people I know well, because it makes me feel confident and not shy to share my ideas." Here, working with peers (functioning) appears to precede feeling confident (feeling). The prominence of relationships within these responses suggests that relational support may enable functioning, which is then associated with positive emotions. This interpretation aligns with research showing that collaborative learning is associated with both enhanced problem-solving and increased mathematical enjoyment (Boaler, 2015). The emphasis on relationships may also reflect New Zealand cultural values, particularly among Māori and Pacific learners, for whom collective and reciprocal relationships are central to learning (Hunter & Hill, 2025).

Students also frequently described accomplishment-related experiences before positive feelings: “When I get it right...I feel very accomplished and then proud of myself” (i.e., accuracy before pride, *n* = 76); general accomplishment before feeling good (*n* = 76); and successfully understanding mathematics before positive feelings (*n* = 76). This pattern resonates with expectancy-value theory in mathematics education (Wigfield & Eccles, 2000), which proposes that students’ success experiences influence their expectancies for future success and their subjective task values. When students experience successful functioning—such as getting correct answers or understanding concepts—their perceived competence may increase, which can be accompanied by positive emotions. Research supports associations between perceived mathematical competence and both enjoyment and continued engagement (Guo et al., 2015). This theoretical lens helps explain the predominance of functioning-before-feeling patterns in our data: successful functioning may serve as a precursor to positive emotional experiences in mathematics, rather than emotions driving functioning.

Students who described feeling before functioning was lesson common (*n* = 41). Students described enjoyment as associated with practice and effort (*n* = 21), stating “Maths is very fun—it helps me get better and try my best” and “I’m good at maths because I enjoy it, and if I enjoy it, I practice it.” Here, enjoyment appears to precede or co-occur with engagement in practice. Confidence was also described before engagement (*n* = 8): “Feeling confident...makes me feel like I can do anything.” These accounts suggest that for some students, positive emotions may be associated with subsequent engagement, though the relatively small number of such responses suggests this pattern may be less common in mathematics contexts.

Interestingly, six students described positive feelings toward mathematics alongside reports of low functioning, for example, “I’m not that good at maths but I love maths”. These findings suggest that hedonic and eudaimonic dimensions can be experienced separately, at least for some students. Future research should explore when students experience these mixed reactions.

Implications for mathematical wellbeing

These findings offer several insights for MWB theory and practice. First, hedonic and eudaimonic dimensions do not appear to operate symmetrically in students’ descriptions of their mathematical experiences. The predominance of students describing functioning before feeling suggests that creating conditions for successful functioning—through relationships, accomplishment experiences, and cognitive engagement—may be associated with positive emotional experiences. From a practical perspective, this suggests mathematics educators might focus on supporting successful functioning rather than attempting to generate positive emotions directly.

Second, relationships appear central in students’ descriptions of their MWB. Students positioned relationships as conditions enabling functioning, which was then described alongside positive feelings. This highlights the potential importance of collaborative

learning structures and supportive classroom relationships (peers and teachers) as foundational elements in supporting MWB.

Third, the predominance of eudaimonic-only responses (61%) does not necessarily indicate an absence of positive emotions. Rather, positive feelings may be experienced but not articulated independently from functioning experiences. This pattern underscores the value of explicitly assessing both hedonic and eudaimonic dimensions when evaluating students' MWB. Alternatively, it raises questions about whether eudaimonic experiences alone can constitute meaningful MWB, or whether the absence of articulated positive emotions represents lower MWB. Future research should explore whether students describing only functioning are indeed experiencing positive emotions that remain unarticulated, or whether they represent a distinct wellbeing profile.

CONCLUSION

Students' descriptions of MWB reveal an asymmetry between hedonic and eudaimonic dimensions. The predominance of students describing functioning before feeling—particularly through relationships and accomplishment experiences—suggests that positive emotions may typically be experienced as associated with successful functioning rather than as preceding it. For mathematics educators, these findings highlight the potential importance of creating enabling mathematics learning environments where students can experience successful functioning, such as through collaborative structures, responsive support, and cognitively challenging tasks. Understanding how functioning and feeling are related in students' experiences may inform efforts to support both dimensions of MWB.

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