

## Annexures

### Annexure 1: Detailed Mapping of Mindset-Specific Accounting Education Findings to the MMS

Table 2 maps the mindset-specific studies to the MMS elements, but is limited to the MMS element categories for brevity and clarity. The details of the studies' alignment to the MMS elements are below.

Study & Level of Studies	Implicit Beliefs (Beliefs about Intelligence) (Section 4)	Goal Orientation (Performance vs. Learning Goals) (Section 5)	Effort Beliefs (Effort vs Struggle) (Section 6)	Response to Failure (Helpless vs. Mastery) (Section 7)
<b>Ravenscroft et al. (2012)</b>  Senior undergraduate and graduate-level accounting students	Measured mindset; 72% Growth-mindset ratio.  <b>Correlation to Performance:</b> Mixed/Inconsistent. Mindset was significantly associated with performance on only one of three exams (Exam 2) and with improvement from Exam 1 to Exam 2 <i>(Sample skewed to performers)</i>	<b>Environment shapes Goals:</b> Observed that the environment (CPA exam requirements) shapes goals towards performance (grades).	-	<b>Inappropriate Learning Strategies:</b> Fixed mindset did not consistently predict academic improvement

<p><b>Liu et al. (2018)</b> Junior (3rd year) undergraduate accounting students</p>	<p>Measured mindset; Estimated &gt;75% Growth-mindset ratio. (Mean score was 2.99 on a 4-point scale, significantly above the 2.5 midpoint).</p> <p><b>Correlation to Performance:</b> Significant positive correlation. Growthers performed significantly better on the final exam than Fixeders. <i>(Sample skewed to performers)</i></p>	<p><i>Goal-setting theory, not goal orientation theory - Investigated students' desire to work for a Big Four firm as a specific goal.</i></p>	<p><i>No indication of effort belief - Study controlled for effort (hours spent),</i></p>	<p><b>Inappropriate Learning Strategies:</b> Growthers who prioritised Big Four goals performed worse on final exams</p>
<p><b>Beatson et al. (2019)</b> First-year students (Introductory course; mixed majors, only 18% intended to major in accounting)</p>	<p>Measured mindset; 80% Growth-mindset ratio.</p> <p><b>Correlation to Performance:</b> No significant correlation. Mindset was not a significant predictor of the final grade in the course; Fixed mindset students with high self-efficacy performed well.</p>	<p>-</p>	<p>-</p>	<p><b>Confidence:</b> Did not decrease after tests (Confidence was only measured once, no second point to compare for increase or decrease)</p>

*(Sample skewed to performers)*

**Farok & Mahmud (2020)**

Measured mindset; 79.6% Growth-mindset ratio.

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**Effort vs Struggle:** 75% displayed 'moderate levels' of grit; Appears to be before failure trigger

**Inappropriate Learning Strategies:** No correlation between grit and performance; effort did not translate to results

Undergraduate accounting students (Year level not specified)

**Correlation to Performance:** Significant positive correlation. Growth mindset was a significant positive predictor of academic success (CGPA), while fixed mindset was a significant negative predictor.  
*(Sample skewed to performers)*

## Annexure 2: Detailed Mapping of non-Mindset Accounting Education Findings to the MMS

Table 3 maps the non-mindset studies to the MMS elements, but is limited to the MMS element categories for brevity and clarity. The details of the studies' alignment to the MMS elements are below.

Study & Level of Studies	Implicit Beliefs (Beliefs about Intelligence) (Section 4)	Goal Orientation (Performance vs. Learning Goals) (Section 5)	Effort Beliefs (Effort vs Struggle) (Section 6)	Response to Failure (Helpless vs. Mastery) (Section 7)
<p><b>AlBassam et al. (2019)</b></p> <p>Undergraduate accounting students (All years of study)</p>	-	-	-	<p><b>Inappropriate learning strategies:</b> Students demonstrated strong dependence on lecturer-led delivery ('spoon-feeding') and weak self-directed study skills.</p>
<p><b>Blondeel et al., (2023)</b></p> <p>First-year undergraduate accounting students</p>	-	<p><b>Evaluative Sensitivity:</b> Perfectionism ("I first need to review everything... before starting"); prioritised immediate competence over learning; fear of failure linked to performance goals.</p>	-	<p><b>Disengagement:</b> Procrastination identified as an avoidance mechanism: "I will just not start with it... I will not be able to do it".</p>

<b>Byrne et al. (2014)</b>	-	<b>Help-seeking avoidance; Evaluative Sensitivity:</b> Students preferred studying independently to tutorials (40% lacked confidence to engage) and avoided asking for help to avoid exposing perceived inadequacy.	-	-
First-year accounting students				
<b>Dull et al. (2015)</b>	-	<b>Environment shapes goals:</b> Found that a blend of learning and performance orientations was associated with higher achievement, suggesting the environment (assessment focus) may require performance goals for progression; warned that it may 'mask vulnerabilities' for later learning.	-	-
Undergraduate accounting students				

<p><b>Eiselen and Geysler (2004)</b></p> <p>First-year accounting students</p>	<p><b>Identity-based beliefs:</b> At-risk students attributed peers' success to 'natural talent' (Fixed belief)</p> <p><b>Locus of control:</b> At-risk students blamed external factors (lecturers) for their own failure.</p>	<p><b>Help-seeking avoidance; Evaluative Sensitivity:</b> At-risk students avoided academic support tools and found public sharing of test results humiliating; Dismissed prior learning as a 'waste of time' as it did not immediately translate to current academic success.</p>	<p><b>Misaligned effort:</b> At-risk students reported lower discipline and higher procrastination (Delay Avoidance scores significantly lower); Avoided engaging with academic support tools.</p>	<p><b>Inappropriate learning strategies:</b> Failed to adapt study methods.</p>
<p><b>Fisher et al. (2024)</b></p> <p>Junior (72%) and Senior (24%) undergraduate accounting students</p>	<p><b>Identity-based beliefs:</b> 'Maladaptive perfectionism' linked to fixed beliefs; students endorsed "If I fail at school, I am a failure as a person".</p>	<p>-</p>	<p>-</p>	<p><b>Disengagement:</b> High levels of cognitive test anxiety ('freezing up') and withdrawal were predicted by maladaptive perfectionism.</p>

<p><b>Gracia and Jenkins (2002)</b></p> <p>Second and final-year undergraduate accounting students</p>	<p><b>Identity-based beliefs;</b> Students described failure in stable terms ("I have a bad memory", "I don't deserve to be on the course")</p> <p><b>Locus of control:</b> Failed students were reluctant to take control of their learning, blaming the quality of teaching and workload.</p>	<p><b>Help-seeking avoidance;</b> <b>Evaluative Sensitivity:</b> Reluctance to participate in class due to fear of being "wrong" and embarrassment.</p>	<p><b>Misaligned effort:</b> Passive learning approach; expectation that tutors should 'provide' learning rather than developing it through effort.</p>	<p><b>Inappropriate learning strategies:</b> Inability to manage time or adopt appropriate study methods; "I am not good at organising myself".</p>
<p><b>Jackling (2005)</b></p> <p>Second-year undergraduate accounting students</p>	<p><b>Locus of control:</b> High dissatisfaction with teaching quality/workloads, externalising responsibility for learning.</p>	<p><b>Environment shapes goals:</b> Students perceived assessment tasks as requiring rote memorisation and adopted surface strategies to meet demands.</p>	<p><b>Misaligned effort:</b> Students calculated the 'cost' of deep effort outweighed the return, reverting to surface learning.</p>	<p><b>Inappropriate learning strategies:</b> Reliance on surface strategies (memorisation) led to failure in answering conceptual questions.</p>

<p><b>Janse van Vuuren et al. (2021)</b></p> <p>Postgraduate accounting students</p>	-	-	<p><b>Misaligned effort:</b> Reported low levels of 'vigour' (willingness to invest effort) and absorption; diminished capacity to invest effort when return is low.</p>	<p><b>Disengagement:</b> High levels of anxiety and depression (35% displayed 'mild to severe anxiety'); psychological withdrawal from studies; 91% of students receiving psychological treatment cited studies as a source of distress.</p>
<p><b>Khan et al. (2023)</b></p> <p>Undergraduate / Professional stream students (studying ACCA/CA)</p>	<p><b>Identity-based beliefs:</b> Suggests students withdraw due to 'actual or pre-emptive failure' driven by entity theorist beliefs that circumstances are beyond influence.</p>	-	-	<p><b>Disengagement:</b> Grit and resilience were negative predictors of academic burnout; low resilience was linked to withdrawal.</p>
<p><b>Mashishi and Rabin (2000)</b></p> <p>Fourth-year accounting students</p>	-	-	-	<p><b>Inappropriate learning strategies:</b> Fourth-year students persisted with surface learning strategies despite the lecturer's expectations for deep learning; all students had passed the prior three years on their first attempt.</p>

<p><b>Molendijk et al (2024)</b> -</p> <p>Undergraduate students (Courses covered all three years of the degree)</p>	<p><b>Environment shapes goals:</b> -</p> <p>'Assessment' was rarely mentioned for engagement/disengagement in non-assessed activities, suggesting goals shift when assessment pressure is removed.</p>	<p><b>Disengagement:</b> Teaching material was the leading cause of disengagement (cited 'boredom' and 'too much information'); However, it was also the leading cause of engagement (cited 'interesting' and 'detail'); Disengagement may be a helpless response, not an objective assessment of teaching material</p>
<p><b>Natoli et al. (2020)</b></p> <p>Second and third-year accounting students</p>	<p><b>Locus of control:</b> &gt;90% -</p> <p>rated teaching quality/workload negatively, externalising responsibility; passive stance.</p>	<p><b>Inappropriate learning strategies:</b></p> <p>91.9% adopted a surface learning approach - mirroring the ratings of negative perceptions of teaching quality</p>
<p><b>Ontong, De Waal and Wentzel. (2020)</b> -</p> <p>All years (First-year through to Honours/ Postgraduate)</p>	<p><b>Environment shapes goals:</b> -</p> <p>Students prioritised "Assistance with examination techniques" (58%) over study advice or content, indicating a short-term performance focus driven by pass rates.</p>	<p>-</p>

<b>Smith et al. (2020)</b>	-	-	-	<b>Disengagement:</b> Role stressors (ambiguity/overload) significantly increased burnout and intentions to depart the major; resilience acted as a protective mechanism.
Undergraduate accounting students (Primarily second and third year)				
<b>Van den Berg and Rothmann (2024)</b>	<b>Locus of control:</b> Cynicism stems from a perceived 'lack of efficacy and control' over educational outcomes; feeling disempowered.	-	-	<b>Disengagement:</b> Cynicism was a strong predictor of the "intention to leave" the university; psychological detachment.
Senior undergraduate students (Completed at least their first year)				

*\*Note: None of these studies are based on mindset research. Comments on MMS elements are indirect and are interpreted through the theoretical lens of the Mindset Meaning System.*