



Vol.9 No.2 (2026)

# Journal of Applied Learning & Teaching

ISSN: 2591-801X

Proudly owned and sponsored by Kaplan Business School, Australia

Content Available at: <https://jalt.open-publishing.org/index.php/jalt/index>

## Pathways to success: Motivational and sociodemographic predictors of academic achievement in enabling education programs

Md Wahid Murad <sup>A</sup>

<sup>A</sup> Adelaide University, Australia

Negin Mirriahi <sup>B</sup>

<sup>B</sup> Adelaide University, Australia

Natasha Wilson <sup>C</sup>

<sup>C</sup> Adelaide University, Australia

### Keywords

Academic achievement;  
enabling education;  
motivation;  
MSLQ instrument;  
pathway programs;  
self-regulated learning strategies.

### Abstract

This study examined the extent to which motivational and sociodemographic factors predict academic achievement among students enrolled in Australian university enabling education programs. Using the 44-item Motivated Strategies for Learning Questionnaire (MSLQ), survey data were collected from 267 participants, with 252 complete responses retained for analysis. Principal Component Analysis (PCA) supported a five-component MSLQ structure comprising self-efficacy, intrinsic value, test anxiety, cognitive strategy use, and self-regulation, which together accounted for 67.81% of the total variance. Eighteen items with strong factor loadings were retained for subsequent regression analysis. Multiple Linear Regression (MLR) indicated that having English as a first language was positively and significantly associated with academic achievement ( $p < 0.001$ ). Participation was also positively associated with final grade, although this finding should be interpreted cautiously because participation contributed directly to the calculation of the final grade. Two MSLQ items were also significantly associated with academic achievement: perceived transferability of learning (intrinsic value) and the use of self-questioning to monitor understanding (self-regulation) ( $p < 0.01$ ). These findings highlight the relevance of language-related support, perceived transferability of learning, and metacognitive self-regulation in enabling educational contexts. Future research should employ larger, multi-institutional, and international samples to evaluate the robustness and generalisability of these predictors.

### Correspondence

[wahid.murad@adelaide.edu.au](mailto:wahid.murad@adelaide.edu.au) <sup>A</sup>

### Article Info

Received 6 September 2025

Received in revised form 2 October 2026

Accepted 5 October 2026

Available online 19 October 2026

DOI: <https://doi.org/10.37074/jalt.2026.9.2.14>

## Introduction

Academic achievement is shaped not only by prior knowledge and sociodemographic circumstances but also by how students motivate and regulate their learning. Within self-regulated learning (SRL), motivational beliefs such as self-efficacy and intrinsic value influence the cognitive and metacognitive strategies students use, while test anxiety can impede performance (Pintrich & de Groot, 1990; Pintrich et al., 1991). Meta-analysis and empirical evidence link motivational constructs with engagement and achievement across higher-education contexts (Raza et al., 2021; Latip et al., 2025).

In Australia, enabling pathway programs provide alternative routes to university for students who may not meet conventional entry requirements and disproportionately serve equity and non-traditional cohorts. They are often characterised by educational disadvantage and varied prior preparation for transition into university study, with completion rates that remain lower than those of undergraduate programs (Hattam et al., 2024). While limited research has examined the SRL capabilities of enabling students, existing evidence suggests that students from equity groups demonstrate lower SRL capabilities and poorer learning outcomes than their peers (Guo et al., 2022). Given that approximately 70% of enabling students belong to one or more equity groups (Hattam & Weiler, 2021), understanding SRL within enabling cohorts can provide valuable insight. Investigating SRL in this context may improve understanding of factors that contribute to disparities in academic achievement and inform strategies to support student success. While motivation and sociodemographic predictors of achievement are well established in mainstream higher education, comparatively little research has examined their relative contributions to academic achievement within enabling education settings (Baker et al., 2022).

Hence, this study aims to examine how students' motivational dimensions and sociodemographic factors jointly relate to achievement in an under-researched enabling education context. While motivation and sociodemographic predictors are not novel constructs, this contributes to the literature by providing a contextual and integrative perspective on academic achievement in enabling education and highlights implications for future investigation.

## Literature review

Self-regulated learning (SRL) refers to learners' active management of goals, cognition, motivation, and behaviour during learning (Schraw et al., 2006; Pintrich, 2000). Pintrich and de Groot's (1990) SRL framework links motivational beliefs to strategy use and academic achievement. The following literature review provides a concise summary of the SRL processes underpinning the study reported in this manuscript, followed by an overview of the related sociodemographic factors.

### Self-efficacy

According to Pintrich et al. (1991), self-efficacy concerns students' beliefs about their capacity to succeed in academic tasks. Higher self-efficacy is generally associated with stronger cognitive strategy use, self-regulation, persistence, and achievement (Pajares, 1996; van Dinther et al., 2011; Honicke & Broadbent, 2016). In SRL models, its importance therefore lies less in its role as an isolated trait than in its function as a motivational belief that can shape how students engage with and persist in learning.

### Test anxiety

Test anxiety combines cognitive worry and affective responses to assessment (Cassady & Johnson, 2002). Although moderate anxiety may not be harmful, excessive anxiety can divert cognitive resources and is generally associated with poorer academic performance (Rana & Mahmood, 2010; Oladipo & Ogungbamila, 2013) in contradiction to self-efficacy.

## **Cognitive strategies**

Cognitive strategies range from surface approaches, such as rehearsal, to deeper approaches, such as summarising and paraphrasing. Deep strategy use is more consistently associated with intrinsic motivation, meaningful engagement, and continued learning (Lyke & Kelahe Young, 2006; Diseth et al., 2010). The present study therefore considers cognitive strategy use as one mechanism through which motivation may translate into academic performance. Existing research indicates students entering higher education through pathway programs typically have had fewer opportunities to develop the academic skills and cognitive strategies required for university level study (Wilson & King, 2024) and warrants further evaluation using validated tools, such as the Motivated Strategies for Learning Questionnaire (MLSQ).

## **Metacognitive self-regulation**

Metacognitive self-regulation involves planning, monitoring understanding, and adjusting learning strategies when needed (Pintrich, 2000; Panadero, 2017). These processes enable students to evaluate their progress and respond strategically to learning difficulties. Prior studies associate effective self-regulation with stronger motivation and academic achievement (Bai & Wang, 2020), making it especially relevant for enabling education students adapting to university expectations.

## **Sociodemographic factors**

### ***Gender and academic achievement***

Limited research suggests gender differences in academic achievement stem from stereotype threats (Shapiro & Williams, 2012), disparities in motivation and self-concept (Voyer & Voyer, 2014), and female students' greater engagement in reading (Logan et al., 2011). Female students have been found to outperform their male counterparts on standardised tests and to attain more educational and post-educational qualifications (Voyer & Voyer, 2014).

### ***Work status and academic achievement***

Studies have shown that employment negatively impacts academic performance, with full-time work (driven by financial need) showing stronger adverse effects than part-time work (Hossler et al., 2014; Rokicka, 2014). According to a study by Singh et al. (2007), reduced study time and engagement mediate this relationship.

### ***Language proficiency and academic achievement***

English proficiency is a critical predictor of academic achievement in English-medium instruction, influencing content comprehension, class participation/engagement, and assessment performance (Feng et al., 2023; Wilkinson & Silliman, 2010). For bilingual students, language proficiency also correlates with well-being and academic outcomes (Hessel & Strand, 2023).

## **Conceptual integration and hypothesis development**

The theory of Self-Regulated Learning (SRL) explains how motivation is translated into strategic behaviours such as monitoring understanding, self-questioning, and adapting study approaches. Self-efficacy and test anxiety can facilitate or constrain this process, while cognitive strategy use represents the enactment of learning effort. The study presented in this manuscript uses the Motivated Strategies for Learning Questionnaire (MSLQ), one of the most widely used and validated self-report instruments for assessing SRL processes (Duncan & McKeachie, 2005; Roth et al., 2016). Rather than treating motivation and learning strategies as separate influences, this study examines how five MSLQ dimensions (e.g. self-efficacy, intrinsic value, test anxiety, cognitive strategy use, and self-regulation) operate within enabling education, a context in which these relationships remain underexplored.

In this study, motivational beliefs are expected to be reflected in the five established MSLQ dimensions, and selected motivational or strategic indicators may be associated with achievement alongside contextual factors such as language background and participation. The cross-sectional study does not test a causal sequence such as intrinsic motivation → self-regulation → achievement. Rather, it tests whether the theoretically related indicators are structured consistently with the MSLQ dimensions and whether they show independent associations with student academic achievement. This distinction aligns the theoretical framework with the exploratory Principal Component Analysis (PCA) and multivariable regression analysis described below. This study begins by validating the MSLQ for an enabling education cohort using PCA to then determine which items have strong and coherent loadings to include in the subsequent multiple linear regression model to test the hypotheses below.

### ***Hypothesis***

The first set of research hypotheses concerns the (factor) loadings of the MSLQ items rather than their causal effects on student academic achievement with the expectation that item responses will yield strong and coherent loadings on each of the five established MSLQ dimensions. The results of Hypothesis 1 then inform the multiple linear regression analysis conducted to test Hypothesis 2:

H1a: Self-efficacy items will yield strong and coherent loadings on the self-efficacy dimension.

H1b: Intrinsic value items will yield strong and coherent loadings on the intrinsic value dimension.

H1c: Test anxiety items will yield strong and coherent loadings on the test anxiety dimension.

H1d: Cognitive strategy items will yield strong and coherent loadings on the cognitive strategy dimension.

H1e: Self-regulation items will yield strong and coherent loadings on the self-regulation dimension.

The second set of research hypotheses examines whether significant linear relationships exist between (a) the motivated learning strategies identified in Hypothesis 1 and (b) student sociodemographic factors, in predicting academic achievement. So, Hypothesis 2 contains two sub-hypotheses:

H2a: Individual MSLQ items retained following PCA are significantly associated with students' academic achievement.

H2b: Sociodemographic factors (course participation, intended undergraduate study, gender, work status, prior education, and English proficiency) significantly predict academic achievement in enabling education programs.

## **Methodology**

### **Data collection and sampling**

We employed Pintrich and de Groot's (1990) 44-item MSLQ survey using a 7-point Likert scale to assess five key dimensions: self-efficacy (SE), intrinsic value (IV), test anxiety (TA), cognitive strategy (CS), and self-regulation (SR). The survey also collected sociodemographic information including gender, work status, prior education, English proficiency, and future study intentions. Data collection began following institutional ethics approval.

Participants were drawn from economics and personal finance, quantitative skills, and physiology courses in the University of South Australia's enabling education programs across four semesters (2021-2022). Of 267 initial student participants (67.59% participation rate), 252 complete surveys were retained after excluding questionnaires with missing or erroneous data.

## Reliability

Prior to starting the main analysis, we assessed reliability using Cronbach's alpha ( $\alpha$ ) and computed descriptive statistics for all 44 MSLQ items. The full scale demonstrated excellent internal consistency ( $\alpha = 0.887$ ).

## Data preparation and analysis

Prior to running analysis, the dataset was rigorously cleaned by addressing missing values, inconsistencies, and outliers while assessing data normality (Hair et al., 2019). Descriptive statistics (means, standard deviations, skewness, kurtosis) for all 44 MSLQ items were examined to verify suitability for Principal Component Analysis (PCA).

### *Principal Component Analysis (PCA)*

To test Hypothesis 1, we employed PCA as an exploratory data-reduction technique to examine whether the 44 MSLQ items could be reduced to a smaller set of components that aligned with the instrument's five theoretical dimensions. PCA was not used to establish causal effects or to validate a latent measurement model. Component retention used the eigenvalue-greater-than-one criterion, followed by Varimax rotation with Kaiser normalisation. A scree plot also reaffirmed five components with an eigenvalue of 1.0 or higher. Following Varimax rotation with Kaiser normalisation, a component-loading threshold of  $\geq 0.40$  was used for item retention and interpretation, with coefficients below 0.40 suppressed. This criterion resulted in the retention of 18 MSLQ items for subsequent interpretation and regression analysis. We acknowledge that reliance on the Kaiser normalisation and scree plot criteria is less robust as a construct validation technique than combining with confirmatory factor analysis. Since additional diagnostic was not part of the original analysis, the component solution is interpreted as exploratory rather than definitive validation of the MSLQ instrument.

### *Multiple Linear Regression (MLR)*

Multiple Linear Regression (MLR) tested Hypothesis 2 by examining the independent associations of the 18 PCA-retained MSLQ items and six sociodemographic variables with academic achievement. This item-level specification was exploratory and was retained to identify which specific learning strategies or perceptions were associated with grades. We recognise that moving from component-level data reduction to item-level regression creates a conceptual tension and a relatively parameter-rich model. Accordingly, coefficients are interpreted as item-level associations rather than construct-level effects.

Regression assumptions and diagnostics were also examined. Multicollinearity was assessed using tolerance and variance inflation factor (VIF) statistics. Across all predictors, tolerance values ranged from 0.338 to 0.925, and VIF values ranged from 1.081 to 2.962, indicating no evidence of multicollinearity problems. Visual inspection of the normal P-P plot of standardised regression residuals showed that the observed cumulative probabilities followed the expected diagonal reasonably closely, providing support for approximate normality of the residuals.

### *Sample adequacy for Principal Component Analysis*

Sampling adequacy and factorability were assessed before PCA was conducted. The Kaiser-Meyer-Olkin (KMO) measure exceeded the minimum criterion of 0.50, while Bartlett's test of sphericity was significant ( $p < 0.01$ ), indicating sufficient intercorrelation among the MSLQ items to proceed with PCA.

Five components were retained using the eigenvalue-greater-than-one and scree plot criterion and interpreted in relation to the MSLQ's theoretical dimensions: self-efficacy, intrinsic value, test anxiety, cognitive strategy use, and self-regulation. Together, the five retained components explained 67.81% of the total variance: Component 1 = 29.26%, Component 2 = 15.36%, Component 3 = 9.65%, Component 4 = 7.28%, and Component 5 = 6.25%.

## Empirical results

### Descriptive statistics

All variables except cognitive strategy 5 (CS5) demonstrated skewness and kurtosis values within the acceptable normality range of -2.58 to +2.58, meeting assumptions for PCA and MLR. Although CS5 exhibited marginally elevated kurtosis (3.00), its skewness (-1.25) fell within normal parameters. Given the substantial sample size ( $n = 252$ ), this minor deviation has negligible analytical impact (Byrne, 2016; Hair et al., 2019).

### *Hypothesis 1: Principal Component Analysis of motivated learning strategies*

Table 1 reports the rotated component loadings for the 18 MSLQ items retained for interpretation across the five components. A component loading represents the strength and direction of the association between an observed item and a component. Larger absolute loadings indicate that an item contributes more strongly to the interpretation of that component. The Varimax rotation with Kaiser normalisation converged in six iterations.

The rotated solution showed a conceptually interpretable pattern. For example, reported in Table 1, TA2 ("I have an uneasy, upset feeling when I take a test") loaded most strongly and coherently on the test anxiety component (0.899), which supports H1c. Similarly, the retained self-efficacy and intrinsic value items loaded most strongly and coherently on their respective components, which support H1a and H1b, respectively. Also, the retained cognitive strategy and self-regulation items loaded most strongly and coherently on their respective components, which support H1d and H1e, respectively. These loadings are used to interpret the component structure; hence, they should not be read as regression effects or as evidence that an item independently predicts academic achievement. Loadings closer to  $\pm 1$  reflect stronger variable-component associations.

The PCA therefore generated five retained components explaining 67.81% of total variance, with 18 items showing strong loadings in the rotated component matrix reported in Table 1. These 18 strongly and coherently loaded items were carried forward as motivational predictors in the regression model. The remaining MSLQ items were not included in the subsequent regression because they did not meet the loading criterion used for the reported rotated matrix.

### *Hypothesis 2: Multiple Linear Regression Model of motivated learning strategies*

The regression model was statistically significant ( $F = 6.36$ ,  $p < 0.001$ ) and explained 34% of the variance in academic achievement after adjustment for the number of predictors (adjusted  $R^2 = 0.34$ ). The Durbin-Watson statistic was 1.85, indicating no evidence of a first-order autocorrelation problem. Collinearity diagnostics were within acceptable ranges (tolerance = 0.338-0.925; VIF = 1.081-2.962), providing no indication of multicollinearity among the predictors. The normal P-P plot of standardised residuals also showed observations tracking the expected diagonal reasonably closely, supporting approximate residual normality. Table 2 reports the estimated coefficients for the sociodemographic variables and the 18 PCA-retained MSLQ items. Table 2 reports the estimated coefficients for the sociodemographic variables and the 18 PCA-retained MSLQ items. The fitted regression equation is:

Substituting the coefficients from Table 2 into the regression equation yields the following equation:

Table 1. Rotated component matrixa generated by PCA, showing strong and coherent loadings for 18 MSLQ items across five theoretical dimensions/components.

| Variable                                                                                                          | Component/Dimension |                      |                   |                         |                      |
|-------------------------------------------------------------------------------------------------------------------|---------------------|----------------------|-------------------|-------------------------|----------------------|
|                                                                                                                   | 1<br>Self-Efficacy  | 2<br>Intrinsic Value | 3<br>Test Anxiety | 4<br>Cognitive Strategy | 5<br>Self-Regulation |
| SE3. I expect to do very well in this class                                                                       | .753                |                      |                   |                         |                      |
| SE6. I think I will receive a good grade in this class                                                            | .728                |                      |                   |                         |                      |
| SE2. I am certain I can understand the ideas taught in this course                                                | .725                |                      |                   |                         |                      |
| SE9. I know that I will be able to learn the material for this class                                              | .717                |                      |                   |                         |                      |
| SE8. Compared with other students in this class I think I know a great deal about the subject                     | .714                |                      |                   |                         |                      |
| SE1. Compared with other students in this class I expect to do well                                               | .694                |                      |                   |                         |                      |
| IV8. I think that what we are learning in this class is interesting                                               |                     | .846                 |                   |                         |                      |
| IV9. Understanding this subject is important to me                                                                |                     | .792                 |                   |                         |                      |
| IV3. I like what I am learning in this class                                                                      |                     | .764                 |                   |                         |                      |
| IV4. I think I will be able to use what I learn in this class in other classes                                    |                     | .742                 |                   |                         |                      |
| IV7. I think that what I am learning in this class is useful for me to know                                       |                     | .645                 |                   |                         |                      |
| TA2. I have an uneasy, upset feeling when I take a test                                                           |                     |                      | .899              |                         |                      |
| TA4. When I take a test, I think about how poorly I am doing                                                      |                     |                      | .887              |                         |                      |
| TA3. I worry a great deal about tests                                                                             |                     |                      | .871              |                         |                      |
| CS3. When I study, I put important ideas into my own words                                                        |                     |                      |                   | .830                    |                      |
| CS1. When I do homework, I try to remember what the teacher said in class so I can answer the questions correctly |                     |                      |                   | .819                    |                      |
| SR8. When I am reading, I stop <u>once in a while</u> and go over what I have read                                |                     |                      |                   |                         | .787                 |
| SR1. I ask myself questions to make sure I know the material I have been studying                                 |                     |                      |                   |                         | .722                 |

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalisation.

a. Rotation converged in 6 iterations.

Table 2. Regression model of motivated learning strategies and sociodemographic/engagement factors predicting academic achievement of students in enabling education programs.

| Variables in the Model                                                                         | Unstandardised Coefficients |            | t     | Sig. | Standardised Coefficients<br>$\beta$ |
|------------------------------------------------------------------------------------------------|-----------------------------|------------|-------|------|--------------------------------------|
|                                                                                                | B                           | Std. Error |       |      |                                      |
| Constant ( $\alpha$ )                                                                          | 23.83                       | 14.03      | 1.70  | 0.09 |                                      |
| Participation                                                                                  | 5.10***                     | 0.53       | 9.59  | 0.00 | 0.52                                 |
| Plan to study a UG program                                                                     | 4.64                        | 4.00       | 1.16  | 0.25 | 0.07                                 |
| Gender                                                                                         | 2.28                        | 2.48       | 0.92  | 0.36 | 0.05                                 |
| Work status                                                                                    | -1.96                       | 2.35       | -0.84 | 0.40 | -0.05                                |
| Previous years of education                                                                    | 0.15                        | 0.55       | 0.28  | 0.78 | 0.02                                 |
| English as the first language                                                                  | 9.54***                     | 2.58       | 3.70  | 0.00 | 0.22                                 |
| SE1. Compared with other students in this class I expect to do well.                           | -1.62                       | 1.26       | -1.29 | 0.20 | -0.09                                |
| SE2. I am certain I can understand the ideas taught in this course.                            | -1.34                       | 1.79       | -0.75 | 0.46 | -0.06                                |
| SE3. I expect to do very well in this class.                                                   | 1.85                        | 1.70       | 1.09  | 0.28 | 0.09                                 |
| SE6. I think I will receive a good grade in this class.                                        | 2.37                        | 1.45       | 1.63  | 0.10 | 0.12                                 |
| SE8. Compared with other students in this class I think I know a great deal about the subject. | -1.03                       | 1.33       | -0.78 | 0.44 | -0.06                                |
| SE9. I know that I will be able to learn the material for this class.                          | -0.21                       | 1.55       | -0.14 | 0.89 | -0.01                                |
| IV3. I like what I am learning in this class.                                                  | -1.26                       | 1.75       | -0.72 | 0.47 | -0.06                                |
| IV4. I think I will be able to use what I learn in this class in other classes.                | 4.05**                      | 1.46       | 2.77  | 0.01 | 0.20                                 |

Table 2. Continued

|                                                                                                                    |        |      |       |      |       |
|--------------------------------------------------------------------------------------------------------------------|--------|------|-------|------|-------|
| IV7. I think that what I am learning in this class is useful for me to know.                                       | -0.35  | 1.40 | -0.25 | 0.80 | -0.02 |
| IV8. I think that what we are learning in this class is interesting.                                               | -3.15  | 1.89 | -1.67 | 0.10 | -0.14 |
| IV9. Understanding this subject is important to me.                                                                | -1.99  | 1.70 | -1.17 | 0.24 | -0.09 |
| TA2. I have an uneasy, upset feeling when I take a test.                                                           | -0.07  | 1.11 | -0.06 | 0.95 | -0.01 |
| TA3. I worry a great deal about tests.                                                                             | 0.03   | 1.10 | 0.03  | 0.98 | 0.01  |
| TA4. When I take a test, I think about how poorly I am doing.                                                      | 0.37   | 1.13 | 0.33  | 0.74 | 0.03  |
| CS1. When I do homework, I try to remember what the teacher said in class so I can answer the questions correctly. | -1.01  | 0.96 | -1.05 | 0.30 | -0.07 |
| CS3. When I study, I put important ideas into my own words.                                                        | -1.24  | 1.11 | -1.11 | 0.27 | -0.07 |
| SR1. I ask myself questions to make sure I know the material I have been studying.                                 | 3.08** | 1.22 | 2.53  | 0.01 | 0.17  |
| SR8: When I am reading, I stop once in a while and go over what I have read.                                       | -0.87  | 1.00 | -0.87 | 0.38 | -0.05 |

Note: \*\* $p < 0.01$ .; \*\*\* $p < 0.001$ .

Four predictors were statistically significant in the regression model (Table 2). Two were sociodemographic factors: English as the first language ( $B = 9.54, \beta = 0.22, p < 0.001$ ) and participation ( $B = 5.10, \beta = 0.52, p < 0.001$ ), which partially support H2b. Holding other predictors constant, students who reported English as their first language achieved course grades that were, on average, 9.54 marks higher than those of other students. This finding indicates a strong positive association between having English as a first language and academic achievement. The positive participation coefficient indicates a highly strong association between the participation measure and final grades. While participation was positively associated with final grade, this association requires cautious interpretation because participation contributed directly to the calculation of the final course grade. Its coefficient may therefore partly reflect the assessment structure rather than an independent association between participation and academic achievement. Accordingly, no causal interpretation is made. A regression model excluding participation was not estimated in the present study.

Among the 18 MSLQ items entered in the regression, two were statistically significant at  $p < 0.01$ . Intrinsic value item 4 ("I think I will be able to use what I learn in this class in other classes") had a positive coefficient ( $B = 4.05, \beta = 0.20, p = 0.01$ ), while self-regulation item 1 ("I ask myself questions to make sure I know the material I have been studying") also had a positive coefficient ( $B = 3.08, \beta = 0.17, p = 0.01$ ). These item-level findings partially support H2a and suggest that perceived transferability of learning referring to the intrinsic motivation dimension and self-questioning referring to the self-regulation dimension were associated with higher grades after controlling for the other variables in the model.

## Discussion

The empirical findings distinguish between two analytical questions: how the MSLQ items were structured in this sample and which items/factors predicted academic achievement. First, PCA produced five interpretable components corresponding broadly to self-efficacy, intrinsic value, test anxiety, cognitive strategy use, and self-regulation. Together, these components explained 67.81% of the variance in the 44 MSLQ items. The 18 strong item loadings reported in Table 1 provide partial support for Hypothesis 1; however, they do not establish that one MSLQ dimension is more important than another in predicting academic achievement. Specifically, six self-efficacy, five intrinsic value, three test anxiety, two cognitive-strategy, and two self-regulation items loaded strongly and coherently onto their respective dimensions, providing evidence of the interpretability of the component structure.

PCA and regression address different hypotheses and should therefore be interpreted separately. PCA identifies strongly and coherently loaded MSLQ items, which address Hypothesis 1 (H1a-H1e). Whereas, to address Hypothesis 2 (H2a-H2b), regression analysis estimates the associations between individual predictors and academic achievement while holding the other included variables constant. Consequently, a strong component loading does not necessarily imply a significant regression coefficient, and a component's load/share of explained item variance does not necessarily reflect its predictive importance for academic achievement.

The regression results provide partial support for Hypothesis 2 (H2a-H2b). The adjusted  $R^2$  of 0.34 indicates that the full model accounts for a meaningful but not whole share of variation in student academic achievement. This implies that substantial variance remains attributable to factors not modelled here. Although this magnitude of explained variance is broadly consistent with the moderate explanatory power commonly reported in studies of motivation and academic achievement (see Richardson et al., 2012; Robbins et al., 2004), direct comparisons with studies using a smaller number of predictors should be made with caution. The present model includes 18 individual MSLQ items in addition to sociodemographic and engagement variables, which may affect its explanatory power relative to robust parsimonious models. For H2a, only two of the 18 PCA-retained MSLQ items were statistically significant: IV4, reflecting perceived transferability of learning, and SR1, reflecting self-questioning. The other MSLQ items were not independently significant once all predictors were entered simultaneously. These null findings do not demonstrate that self-efficacy, test anxiety, or cognitive strategies are unimportant. Notably, their unique item-level associations may be small, overlapping with related MSLQ items, context dependent, or difficult to estimate precisely in a parameter-rich model.

The concentration of significance in only two MSLQ items also warrants theoretical caution. IV4 may capture personally meaningful value or transfer value, providing a motivational reason to engage, while SR1 represents an active metacognitive behaviour through which engagement is enacted. Their joint emergence is consistent with aspects of SRL, suggesting that intrinsic value, motivation and actively monitoring understanding may be complementary features of academic achievement. However, the present PCA-guided cross-sectional regression model cannot determine whether mediation, moderation, or temporal relationships exist among these processes. Future research should test construct-level models, including theoretically specified pathways such as intrinsic value → self-regulation → achievement, using SEM or longitudinal designs.

### **Intrinsic value and academic achievement**

The significant positive association of the intrinsic value item proposes that intrinsic motivation may be driven by personal relevance and satisfaction, which enhances engagement and achievement. This finding suggests that students who perceive their learning as transferable to other contexts achieve higher grades. This aligns with Lepper (1988), who identified that college students who find meaning in their studies exhibit greater engagement, leading to improved academic outcomes and retention.

### **Self-regulation and academic achievement**

The self-regulation item's significance underscores the role of metacognitive monitoring in academic achievement. Students who employ self-regulation strategies, including self-questioning, take ownership of their learning (Paris & Paris, 2001) and often combine these strategies with intrinsic motivation, high self-efficacy, and deep cognitive processing (Bai & Wang, 2020; Broadbent et al., 2021). Empirical studies consistently link self-regulation to higher motivation and academic achievement (e.g., Pintrich, 2000; Liu et al., 2014).

### **Implications for curriculum design**

Traditional higher education often assumes students arrive with pre-existing academic skills (Hattam et al., 2024). The present associations suggest that enabling curricula may benefit from explicitly teaching metacognitive practices such as self-questioning and demonstrating how current learning transfers to later study. These are low-risk pedagogical directions consistent with transition pedagogy (Kift, 2023) and SRL theory, but they should be evaluated experimentally or longitudinally before being treated as evidence-based causal interventions arising from this study.

The second part of Hypothesis 2 (H2b), which assumed that sociodemographic factors (participation, undergraduate study plans, gender, work status, prior education, and English as first language) predict academic achievement in enabling education, receives partial support. While only two of these six variables, including English as first language and participation, emerged as highly significant predictors ( $p \leq 0.001$ ), their relationship with academic achievement is substantial. Notably, 42% of our survey participants came from non-English-speaking backgrounds, highlighting how language proficiency shapes academic outcomes. In this context, where English is the sole medium of instruction, limited proficiency creates barriers to academic achievement, which aligns with Feng et al. (2023), who identified English competency as critical for success in English-medium courses. This relationship between English language proficiency and academic achievement is well-established, as evidenced by Wilkinson and Silliman's (2010) work on instructional-language dependence and Hessel and Strand's (2023) research on bilingual learners.

Participation was strongly associated with academic achievement, but this coefficient must be interpreted with particular caution. Participation contributed 10% directly to the final course grade used as the dependent variable. Consequently, the model partly uses a component of the outcome to predict the outcome itself. The  $B = 5.10$  coefficient therefore cannot be interpreted as an independent causal effect of attendance or engagement on academic achievement. Aside from participation, three other predictors in the reported model were statistically significant: English as first language, perceived transferability of learning (IV4) and the use of self-questioning to monitor understanding (SR1). A regression model excluding participation was not estimated in the present study. Therefore, future analyses should use an achievement outcome that excludes participation marks, or model participation against assessment components that are independent of the participation grade.

## Conclusion and future research

This study examined the structured MSLQ responses and the sociodemographic and item-level motivational predictors associated with academic achievement in one Australian enabling education setting. Exploratory PCA yielded five interpretable components that broadly corresponded to the established MSLQ dimensions and explained 67.81% of total item variance. In the multivariable regression, three predictors independent of the participation-grade issue, including English as first language, perceived transferability of learning (IV4), and self-questioning (SR1), showed statistically significant positive associations with academic achievement. Participation was also significant, but because it directly contributed to final grades, its coefficient should not be interpreted as an independent achievement effect.

These findings provide context-specific evidence of factors that may influence or predict student success in enabling programs and indicate that language background, perceived transfer value, and metacognitive self-questioning deserve further investigation in enabling education. For practice, educators may consider explicitly communicating the transferability of learning and modelling self-questioning strategies, while institutions should continue to examine language-related barriers. These implications are provisional and should be evaluated in research designs capable of testing causal effects.

Several limitations should be considered when interpreting the key findings. The study was conducted at a single Australian institution across a limited set of enabling courses, so relevance beyond this context is suggestive rather than demonstrated. PCA relied on the eigenvalue greater than one and scree plot criteria without definitive construct validation. The subsequent item-level regression was parameter-rich and may be less robust than a construct-level model. However, the original SPSS output showed acceptable collinearity diagnostics (tolerance = 0.338-0.925; VIF = 1.081-2.962), indicating that multicollinearity was not a concern. The normal P-P plot also supported approximate residual normality. These diagnostics should not, however, be interpreted as robustness checks or as independent validation of the PCA solution. Future multi-institutional and international research should validate the MSLQ structure using structural equation modelling (SEM) to test theoretically specified relationships (including possible mediation from intrinsic value through self-regulation). This would provide a stronger test of whether the patterns observed here extend across enabling education systems in Australia and beyond.

## Declarations

## Acknowledgements

We sincerely thank all participants for their time in completing the survey. We also acknowledge that ChatGPT was used only to edit and condense the original text. All sections of the paper, including the introduction, literature review, hypothesis development, research methodology, data analysis, results, discussion, and conclusion, as well as the brainstorming, sourcing of resources, idea generation, and original writing, were entirely conducted by the authors.

## Declaration of conflicting interest

The authors have no conflicts of interests to declare.

## Funding statement

The authors have received no funding for this research.

## Ethical approval and informed consent statements

Ethical approval was obtained from the University of South Australia Human Research Ethics Committee (Protocol no. 203269). All participants signed their voluntary and informed consent to participate in the research and to the use of their data in publications associated with it.

## References

- Baker, S., Irwin, E., Hamilton, E., & Birman, H. (2022). What do we know about enabling education as an alternative pathway into Australian higher education, and what more do we need to know? A meta-scoping study. *Research Papers in Education*, 37(3), 321–343. <https://doi.org/10.1080/02671522.2020.1849369>
- Bai, B., & Wang, J. (2020). The role of growth mindset, self-efficacy and intrinsic value in self-regulated learning and English language learning achievements. *Language Teaching Research*, 27(1), 207–228. <https://doi.org/10.1177/1362168820933190>
- Broadbent, J., Sharman, S., Panadero, E., & Fuller-Tyszkiewicz, M. (2021). How does self-regulated learning influence formative assessment and summative grade? Comparing online and blended learners. *The Internet and Higher Education*, 50, 100805. <https://doi.org/10.1016/j.iheduc.2021.100805>
- Byrne, B. M. (2016). *Structural equation modelling with AMOS: Basic concepts, applications, and programming* (3rd ed.). Routledge.
- Cassady, J. C., & Johnson, R. E. (2002). Cognitive test anxiety and academic performance. *Contemporary Educational Psychology*, 27(2), 270–295. <https://doi.org/10.1006/ceps.2001.1094>
- Diseth, A., Pallesen, S., Brunborg, G. S., & Larsen, S. (2010). Academic achievement among first semester undergraduate psychology students: The role of course experience, effort, motives and learning strategies. *Higher Education*, 59(3), 335–352. <http://doi.org/10.1007/s10734-009-9251-8>
- Duncan, T. G., & McKeachie, W. J. (2005). The making of the motivated strategies for learning questionnaire. *Educational Psychologist*, 40(2), 117–128. [https://doi.org/10.1207/s15326985ep4002\\_6](https://doi.org/10.1207/s15326985ep4002_6)
- Feng, L., He, L., & Yiganmu, A. (2023). Determinants of students' academic success in English as a medium of instruction (EMI) classes: A systematic review. *Heliyon*, 9(10), e20421. <https://doi.org/10.1016/j.heliyon.2023.e20421>
- Guo, J., King, R. B., Ding, Q., & Fan, M. (2022). Measuring and promoting self-regulation for equity and quality of online learning: New evidence from a multi-institutional survey during COVID-19. *Education Sciences*, 12(7), 465. <https://doi.org/10.3390/educsci12070465>
- Hair, J. F., Risher, J. J., Sarstedt, M., & Ringle, C. M. (2019). When to use and how to report the results of PLS-SEM. *European Business Review*, 31(1), 2–24. <https://doi.org/10.1108/EBR-11-2018-0203>
- Hattam, S., Weiler, T., Hattam, R., & King, S. (2024). Working on enabling pedagogies at UniSA College. In S. Hattam, R. Hattam, T. Weiler, & S. King (Eds.), *Enabling pedagogy and action research in higher education* (pp.1–33). DIO Press.
- Hattam, S. K., & Weiler, T. (2021). 'Every single student counts': Leadership of professional development underpinned by social justice for sessional staff in a South Australian university. *Professional Development in Education*, 47(1), 128–140. <https://doi.org/10.1080/19415257.2020.1814388>

- Hessel, A. K., & Strand, S. (2023). Proficiency in English is a better predictor of educational achievement than English as an Additional Language (EAL). *Educational Review*, 75(4), 763–786. <https://doi.org/10.1080/00131911.2021.1949266>
- Honick, T., & Broadbent, J. (2016). The influence of academic self-efficacy on academic performance: A systematic review. *Educational Research Review*, 17, 63–84. <https://doi.org/10.1016/j.edurev.2015.11.002>
- Hosler, D., Schmit, J., & Vesper, N. (2014). *Going to college: How social, economic, and educational factors influence the decisions students make*. Johns Hopkins University Press.
- Kift, S. (2023). *Transition pedagogy for 21st-century student success*. In C. Baik & E. R. Kahu (Eds.), *Research handbook on the student experience in higher education* (pp. 132–148). Edward Elgar Publishing. <https://doi.org/10.4337/9781802204193.00018>.
- Latip, M. S. A., Latip, S. N. N. A., Tamrin, M., & Rahim, F.A. (2025). Modelling physical ergonomics and student performance in higher education: The mediating effect of student motivation. *Journal of Applied Research in Higher Education*, 17(3), 1081–1098. <https://doi.org/10.1108/JARHE-01-2024-0052>
- Lepper, M. R. (1988). Motivational considerations in the study of instruction. *Cognition and Instruction*, 5(4), 289–309. [https://doi.org/10.1207/s1532690xc0504\\_3](https://doi.org/10.1207/s1532690xc0504_3)
- Liu, W. C., Wang, C. K. J., Kee, Y. H., Koh, C., Lim, B. S. C., & Chua, L. (2014). College students' motivation and learning strategies profiles and academic achievement: A self-determination theory approach. *Educational Psychology*, 34(3), 338–353. <https://doi.org/10.1080/01443410.2013.785067>
- Logan, S., Medford, E., & Hughes, N. (2011). The importance of intrinsic motivation for high and low ability readers' reading comprehension performance. *Learning and Individual Differences*, 21(1), 124–128. <https://doi.org/10.1016/j.lindif.2010.09.011>
- Lyke, J. A., & Kelaher Young, A. J. (2006). Cognition in context: Students' perceptions of classroom goal structures and reported cognitive strategy use in the college classroom. *Research in Higher Education*, 47(4), 477–490. <https://doi.org/10.1007/s11162-005-9004-1>
- Oladipo, S. E., & Ogungbamila, A. (2013). Demographic predictors of test anxiety among undergraduates. *International Journal of Learning and Development*, 3(1), 62–66. <https://doi.org/10.5296/ijld.v3i1.3133>
- Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research*, 66(4), 543–578. <https://doi.org/10.3102/00346543066004543>
- Panadero, E. (2017). A review of self-regulated learning: Six models and four directions for research. *Frontiers in Psychology*, 8, 422. <https://doi.org/10.3389/fpsyg.2017.00422>
- Paris, S., & Paris, A. (2001). Classroom applications of research on self-regulated learning. *Educational Psychology*, 36, 89–101. [https://doi.org/10.1207/S15326985EP3602\\_4](https://doi.org/10.1207/S15326985EP3602_4)
- Pintrich P. R. (2000). The role of goal orientation in self-regulated learning. In M. Boekaerts, P. R. Pintrich, & M. Zein (Eds.), *Handbook of self-regulation* (pp. 452–502). Academic Press.
- Pintrich, P. R., & De Groot, E. V. (1990). Motivational and self-regulated learning components of classroom academic performance. *Journal of Educational Psychology*, 82(1), 33. <https://doi.org/10.1037/0022-0663.82.1.33>
- Pintrich, P. R., Smith, D. A. F., García, T., & McKeachie, W. J. (1991). *A manual for the use of the Motivated Strategies for Learning Questionnaire (MSLQ)*. University of Michigan.

- Rana, R., & Mahmood, N. (2010). The relationship between test anxiety and academic achievement. *Bulletin of Education and Research*, 32(2), 63–74. <https://ssrn.com/abstract=2362291>
- Raza, S. A., Qazi, W., & Yousufi, S. Q. (2021). The influence of psychological, motivational, and behavioural factors on university students' achievements: The mediating effect of academic adjustment. *Journal of Applied Research in Higher Education*, 13(3), 849–870. <https://doi.org/10.1108/JARHE-03-2020-0065>
- Richardson, M., Abraham, C., & Bond, R. (2012). Psychological correlates of university students' academic performance: A systematic review and meta-analysis. *Psychological Bulletin*, 138(2), 353–387. <https://doi.org/10.1037/a0026838>
- Robbins, S. B., Lauver, K., Le, H., Davis, D., Langley, R., & Carlstrom, A. (2004). Do psychosocial and study skill factors predict college outcomes? A meta-analysis. *Psychological Bulletin*, 130(2), 261–288. <https://doi.org/10.1037/0033-2909.130.2.261>
- Rokicka, M. (2014). *The impact of students' part-time work on educational outcomes*. ISER Working Paper Series, No. 2014-42, University of Essex, Institute for Social and Economic Research (ISER), Colchester, England. <https://ideas.repec.org/p/eser/iserwp/2014-42.html>
- Roth A., Ogrin S., & Schmitz B. (2016). Assessing self-regulated learning in higher education: A systematic literature review of self-report instruments. *Educational Assessment, Evaluation and Accountability*, 28(3), 225–250. <https://doi.org/10.1007/s11092-015-9229-2>
- Schraw, G., Crippen, K., & Hartley, K. (2006). Promoting self-regulation in science education: Metacognition as part of a broader perspective on learning. *Research in Science Education*, 36, 111–139. <https://doi.org/10.1007/s11165-005-3917-8>
- Shapiro, J. R., & Williams, A. M. (2012). The role of stereotype threats in undermining girls' and women's performance and interest in STEM fields. *Sex Roles*, 66(3-4), 175–183. <https://doi.org/10.1007/s11199-011-0051-0>
- Singh, K., Chang, M., & Dika, S. (2007). Effects of part-time work on school achievement during high school. *The Journal of Educational Research*, 101(1), 12–22. <https://doi.org/10.3200/JOER.101.1.12-23>
- van Dinther, M., Dochy, F., & Segers, M. (2011). Factors affecting students' self-efficacy in higher education. *Educational Research Review*, 6(2), 95–108. <https://doi.org/10.1016/j.edurev.2010.10.003>
- Voyer, D., & Voyer, S. D. (2014). Gender differences in scholastic achievement: A meta-analysis. *Psychological Bulletin*, 140(4), 1174–1204. <https://doi.org/10.1037/a0036620>
- Wilkinson, L., & Silliman, E. (2010). Academic language proficiency. In C. Clauss-Ehlers (Ed.), *Encyclopedia of cross-cultural school psychology* (pp. 573–576). Springer-Verlag Publishers.
- Wilson, N., & King, T. (2024). 'I asked my grandma how to study': Changing our approach to lectures to support the learner in anatomy and physiology. In S. Hattam, R. Hattam, T. Weiler, & S. King (Eds.), *Enabling pedagogy and action research in higher education* (pp. 93–119). DIO Press.

Copyright: © 2026. Md Wahid Murad, Negin Mirriahi, and Natasha Wilson. This is an open-access article distributed under the terms of the Creative Commons Attribution License (CC BY). The use, distribution or reproduction in other forums is permitted, provided the original author(s) and the copyright owner(s) are credited and that the original publication in this journal is cited, in accordance with accepted academic practice. No use, distribution or reproduction is permitted which does not comply with these terms.