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Research Article

Assessing the Relationship between Motivational Beliefs, Self-Regulated Learning Strategies, and Academic Performance of Freshmen Students

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ABSTRACT

Although learning in higher education is more successful with effective self-regulation skills, freshman students experience serious challenges and doubts about the fit between their readiness and the newfound responsibilities of the program. The purpose of this study was to assess the relationship between motivational beliefs, Self-Regulated Learning (SRL) strategies, and academic performance of freshman students. Data were collected from a convenience sample of 97 (64 male and 33 female) freshman students using the Motivated Strategies for Learning Questionnaire (MSLQ) and were analyzed using hierarchical multiple regression and structural equation modeling. The result revealed that cognitive and metacognitive learning strategies explained about 12.8% of the variance in psychology course achievement, while 23.4% accounted for students' motivational beliefs. Cognitive and metacognitive learning strategies were found to have no significant mediating effect between motivational beliefs and academic achievement. Self-efficacy belief contributed the highest beta weight followed by task value belief. It was concluded that students who value their education and have confidence in their abilities are more likely to demonstrate a higher level of academic performance. Therefore, it is suggested that providing freshman students with self-efficacy training will have a significant positive impact on their academic success.

Keywords: Academic performance; Self-regulated; Learning; Motivated strategies; Learning questionnaire structural equation; Freshman students

INTRODUCTION

Self-Regulated Learning (SRL) plays an essential role in higher education and has become one of the most important topics within educational psychology [1,2]. SRL is even more important now than ever as learning methods are constantly changing and require a lot of autonomy [3]. The inspiration for SRL's relevance to successful learning originates from its active and conscious technique toward learning [4]. This conscious approach to learning involves setting personal goals, monitoring progress and evaluating learning outcomes against those goals. Pintrich [5] SRL theory, on which this study is based, and other SRL theories emphasize the significance of learners' own goals, which should guide students to monitor, regulate and control their cognition, motivation, and behavior to reach the goals they have set for their learning.

According to Zimmerman [2] self-regulation is not a mental ability or a performance skill in the classroom; rather, it is the self-directive process that enables students to translate their mental capacities into academic skills requiring them to plan, monitor and access their learning independently. Moreover, this author suggests that these skills must be adapted to each learning task, and students' learning must involve the use of specific strategies to meet academic goals based on self-efficacy perceptions of their learning.

Even though learning in higher education is more successful with effective self-regulation skills, research shows that not all Higher Education (HE) students can regulate their learning [2-4,6]. In addition, the present researchers' teaching experience and research in the area have witnessed serious challenges and doubts freshman students experience about the fit between their readiness and newfound responsibilities or academic demands of

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the program [7]. It can be argued that freshman students need to successfully self-regulate their learning. This study focused on assessing the relationships among freshman students' motivational beliefs, their use of cognitive and metacognitive learning strategies, and their academic performance at Haramaya University.

There are several definitions of Self-Regulated Learning (SRL), but the regulation of three general components stands out as particularly significant for academic achievement cognitive, metacognitive, and resources management Panadero [1]. Students' self-regulation involves metacognitive strategies for planning, monitoring, controlling, and modifying their cognitive processes, and actual cognitive strategies that students use to learn, remember, and understand concepts offered in learning material. [8]. Different cognitive strategies such as rehearsal elaboration (paraphrasing and summarizing), Organizational skills, and critical thinking have been found to foster active cognitive involvement in learning and produce greater academic achievement [5].

Resources management is the ability of a student to efficiently manage their time and study environment [8]. These include effort regulation is the ability to control attention in the presence of distractors. Peer learning involves studying in groups, and help-seeking involves asking for help from classmates or teachers. While cognitive and metacognitive strategies are concerned with ways of learning to understand the content (e.g., *via.* elaborating on the content or *via* monitoring understanding), resource management strategies pertain to the design of individual learning conditions [9].

However, knowledge of cognitive and metacognitive strategies is not enough to promote student achievement [10]. Students also need to be motivated to employ the strategies and control their cognition and effort. Motivation is necessary for self-regulation as ultimate achievement is mediated by students' self-regulation of their cognition, motivation, and behavior [10].

This study mainly focused on three motivational beliefs (self-efficacy, task value, and control of learning belief), two cognitive levering strategies (critical thinking, and elaboration), and metacognitive and study environment management skills. Because these three motivational components have been theoretically linked to the three general components of Self-Regulated Learning (SRL) (cognitive, metacognitive, and resources management) which are particularly significant for academic performance [8,10].

It is generally accepted HE learners are proficient in applying specific metacognitive strategies and regulation skills in their learning students' metacognitive knowledge is enable learners to understand and monitor their cognitive processes when learners are proficient in applying specific metacognitive strategies and regulation skills in their learning.

Research on motivational beliefs highlights that those students with high self-efficacy high task value and control of learning beliefs had higher academic performance [3]. Student may be motivated towards working on a task if the task itself is important, interesting, and useful for them [11]. Similarly, Azevedo [12] suggested "there is a need for more research on the role of motivational processes (e.g., self-efficacy and regulatory skills)" [12]. However, studies on self-regulation have mainly focused on students of Western cultures [1], while few local studies have focused only on metacognitive and resource components of self-regulation [13].

Given this reality, the purpose of this study was to investigate the relationships between Haramaya University freshman students' motivational beliefs, cognitive and metacognitive learning strategies, and academic performance. It is believed that self-regulation and motivational beliefs, combined, would shave better predictive weight on students' academic achievement than their independent use alone. Students who engage in Self-Regulated Learning (SRL) are actively involved in their learning process so that high motivational belief and good self-regulation in learning can be transformed into action in processing their study goal [13].

Statement of the problem

Previous research have indicated most under-graduate students face a range of new challenges, primarily due to the changed circumstance, and a corresponding failure to use metacognition, limited study skills and lack of motivation [13,14]. Moreover, other studies in motivation and Self-Regulated Learning (SRL) [3,15-17], indicated that students who cannot set their own learning goals and strive to monitor, regulate, and manage their cognition, motivation, and behavior do not obtain their internal locus of control in stressful environments. This deficiency in using effective learning skills might be contributing to poor academic performance.

The objective of the study

The general of objective his study is to investigate the relationship among motivational beliefs, Self-Regulated Learning (SRL) strategies, and academic achievement of freshman students at Haramaya University.

Specific objectives

- To determine the variance shared by three motivational beliefs (self-efficacy, task value, and control of learning beliefs) in academic achievement
- To see whether student's motivational beliefs (self-efficacy, task value, and control of learning beliefs) have a significant relationship with their academic achievement
- To determine the mediating role of cognitive and metacognitive self-regulation in the relationship between motivational beliefs (self-efficacy, task value, and control of learning beliefs) and academic achievement

Theoretical framework

Pintrich [5] general Model of SRL was used as a theoretical framework. It is one of the most significant conceptual models provides an SRL perspective on the motivation and learning of university students. Pintrich [5] SRL models propose four common assumptions about Self-Regulated Learning (SRL) perspectives: Active constructive, potential for control, goal, criterion, or standard, and mediators between personal and

contextual characteristics and actual performance or achievement.

The active constructive assumption is that learners construct their meanings, goals, and strategies from information available in the external environment and their minds. The potential for control assumption suggests that learners can potentially monitor, control, and regulate certain aspects of their cognition, motivation, and behavior as well as some features of their environments. The goal criterion or standard assumption suggests that individuals can set standards or goals in their learning, monitor their progress toward these goals, and then adapt and regulate their behavior to reach their goals. Finally, the mediator assumption suggests that an individual's self-regulation mechanisms mediate the relations between the person, context, and eventual achievement.

Based on these assumptions and the theoretical conceptualization of student motivation [10] defined Self-Regulated Learning (SRL) as an "active, constructive process in which learners monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and the contextual features in the environment". Corresponding to this Zimmerman [18,19] described self-regulated leavening as the degree to which students are metacognitively, motivationally, and behaviorally active participants in their learning process.

According to this theoretical conceptualization, three motivational components may be linked to the three different components of Self-Regulated Learning (SRL): Namely: (a) An expectancy component, which refers to students' beliefs about their expected success in performing a task, (b) A value component, which concerns students' appreciation of and beliefs about the importance of the task for them and (c) An affective component, comprised of students' emotional reactions to the task. This aspect of self-regulation assumes, motivational beliefs were found to significantly link to students' cognitive involvement in the learning task to their academic achievement with self-efficacy and task value belief strongly related to cognitive strategies and academic achievement [10].

In line with these findings, the positive relationship between motivation, Self-Regulated Learning (SRL), and academic achievement is well documented in previous studies [7,15,20,21]. Students who use their self-capacity to control their behavior on goal-directed academic tasks are better in terms of successfully acquiring academic achievement than students who did not use self-capacity to control behavior and learning [6]. In contrast, Muwonge [14] and his associates have found motivational beliefs (especially self-efficacy and task value beliefs) contributed to students' academic performance mainly through their cognitive learning strategies (critical thinking and elaboration skills. These results generally imply cognitive learning strategies fully mediated the relationship between motivational beliefs and academic performance

In general, Pintrich [5] hypothesized that motivational beliefs influence cognitive constructs which are, in turn, both assumed to be related to students' involvement in the learning task and, consequently, to their academic achievement. In light of the foregoing discussion above, an understanding of the structural connections between Self efficacy, intrinsic value, cognitive (such as elaboration and critical thinking) strategies, and metacognitive and effort management strategies with academic achievement was drawn as shown in Figure 1.

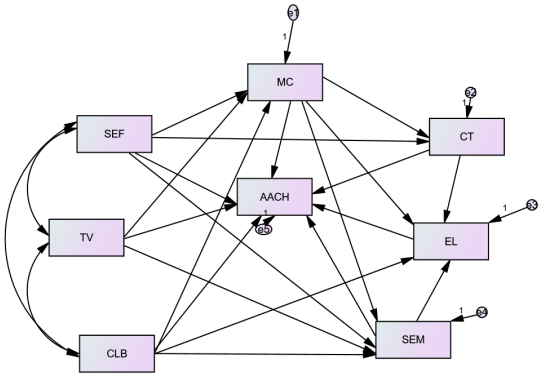

Figure 1: Hypothesized structural model illustrating the direct and indirect relation of students' motivational beliefs to their academic achievement. **Note:** Structural Equation Modeling (SEM); Self-Evaluation Form (SEF); Critical Thinking (CT); English Learner (EL); Canadian Language Benchmark (CLB); Television Viewing (TV); Multiple Choice (MC); Automated Clearing House (AACH).

Based on theory, it was hypothesized that a student's ability to use particular cognitive and metacognitive strategies, together with their motivational beliefs (Self-efficacy, task value, and control of learning beliefs) determines their academic performance.

MATERIALS AND METHODS

Methodologically, the current study employs Structural Equation Modeling (SEM) to assess the correlations between freshman students' motivational beliefs, Self-Regulated Learning (SRL) strategies, and their psychology course achievement.

Participants

Participants were freshman students enrolled at Haramaya University in the 2022/2023 academic year. Using convenience sampling, a total of 97 (64 male and 33 Female) participants were included in the research. Accordingly, students who agreed to participate in the study were selected from two general psychology course sections taught by the researchers completed the questionnaires.

Measures

Academic performance: To assess the student's academic performance, participants' total scores in general psychology course were considered. Scores in a course that are obtained on the midterm and final exams and also semester-work component consisting of a term paper, quizzes, and assignments were all considered as indicators of academic performance. The achievement score varied from 0 to 100 where below 45 is very poor and above 80 is an excellent grade.

Motivated Strategies for Learning Questionnaire (MSLQ): The MSLQ assesses the motivational orientations and learning strategies of college students about certain courses. The MSLQ was developed in 1991 by Pintrich, Smith, Garcia, and McKeachie at the University of Michigan [22]. The instrument is freely accessible in the public domain, simple to score, and comes with interpretations for certain student profiles. Responses on MSLQ were rated on seven-point Likert scales ranging from 1 (not at all true of me) to 7 (very true of me).

The short version of the Motivated Strategies for Learning Questionnaire (MSLQ) consisted of 28 A CFA led to the deletion of four items as they exhibited low factor loadings. Therefore, the modified version had 24 items which were extracted through Confirmatory Factor Analysis (CFA). The originally reported Cronbach's alpha reliabilities of the scales are between 52-80. The factorial structure of the MSLQ was also proved in various studies. Since its development, MSLQ has been employed by several researchers for a variety of research projects [13,23].

In this study, we used only the three motivational beliefs (self-efficacy, task value, and control of learning belief), and two cognitive levering strategies (critical thinking, and elaboration scales), metacognitive and study environment management skills. Sample items used to assess target variables in this study and Cronbach Alpha coefficients are presented in Table 1.

Procedure of data collection

Participants were informed about the purpose and significance of the study. Confidentiality and anonymity of participants' responses were kept and the researchers also assure them their responses were used only for research purposes. Participants were handed over a booklet of Motivated Strategies for Learning Questionnaire (MSLQ) to assess their self-regulation abilities. Moreover, verbal instruction was provided to participants along with written directions to respond to questionnaires.

Method of data analysis

Data were analyzed using hierarchical multiple regression and structural equation modeling using SPSS Version 23 and Amos Graphics. The measurement model was checked to see whether the data matched the recommended level [24]. The structural model was then estimated in two steps. In the first step, we assumed the indirect phase from motivational beliefs through learning strategies to academic achievement. In the second step, the initial model was extended by drawing direct phases from motivational beliefs to academic performance to examine the direct impact of motivational beliefs on academic performance. A chi-square difference test was then used to examine how the model changed after the direct paths were added to the second stage. The mediation effect of cognitive learning and metacognitive strategies between motivational variables and students' academic performance were tested using structural equation modeling

Multiple correlations of the default structural model were used to determine the relationship between the variables. Two blocks of hierarchical multiple regression, in which cognitive and meta cognitive variables and the three motivational variables were entered into the model in separate blocks were used to determine the variance shared by the leaner combination of three motivational variables in academic achievement. Both independent and conjoint effects of the two grope of an independent variables on the dependent variables were determined.

Sample items	Subscales	Cronbach's alpha
I'm certain I can understand the most difficult material presented in the readings for this course.	Self-efficacy	0.757
It is my fault if I don't learn the material in this course	Control of leavening belief	0.768
I think the course material in this class is useful for me to learn	Task value belief	0.756
I often find myself questioning things I hear or read in this course to decide if I find them convincing	Critical thinking	0.756
I make good use of my study time for this course	SEM	0.757
When I study for this class, I pull together information from different sources, such as lectures, readings, and discussions	Elaboration	0.756
I ask myself questions to make sure I understand the material I have been studying in this class.	Metacognitive strategy	0.758

Table 1: Sample Items and the Cronbach alpha coefficients of the sub-scales in the MSLQ.

RESULTS AND DISCUSSION

Model fit was assessed using the Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), and Root Mean Square Error of Approximation (RMSEA). As Schermelleh, et al [24]. Suggested CFI and TLI values ≥ 0.95, SRMR ≥ 08, and RMSEA ≥ 0.06 as acceptable model fit criteria.

The measurement model appeared to have a good agreement as evidenced by fit indices with values of CFI=0.958, TLI=0.948, RMSEA=0.03, and 90% Confidence Interval (CI)=[0,0,059]. The Motivational beliefs and cognitive learning strategies subscales had item loadings ranging from 0.33 to 0.60 and 0.44 to 0.60, respectively. All loadings were statistically significant (p 0.05). The items for the latent variables included in the structural model have rated appropriately for each of the variables.

Correlation coefficients between the predictors themselves and between the predictors and the criterion variable were calculated. Motivational beliefs were positively associated with cognitive and metacognitive learning strategies (P<0.01), as shown in Table 2.

In addition, academic performance was positively correlated with both motivational beliefs and learning strategies <0.01. This implied that students who displayed high self-efficacy, high task value, and high control over learning beliefs achieved higher academic achievement. Variance shared by student's motivational beliefs in their academic performance. In this study, the authors used a two-blocks of hierarchical multiple regression, in which cognitive and metacognitive variables and the three motivational variables were entered into the model in separate blocks. The authors used this to statistically control for the cognitive and metacognitive variables and examine the variance shared by three motivational beliefs (self-efficacy, task value, and beliefs about controlling learning) in predicting academic performance

Hierarchical linear regression analysis in Table 3 shows two models/blocks, of multiple regression analysis. The result shows that cognitive and metacognitive strategies were entered in multiple regression analysis with the absence of motivational variables accounted for 12.8% (R^2=0.128, F(4,92)=3.366, P=0.013) of variance in psychology course achievement. Model 2 accounted about 23.4% (R^2=0.234, F(3,89)=10.880, P<0.00I) of variance in this course achievement. When the motivational components were added to the regression models, they resulted in significant changes in the overall predictions of the models. The addition of motivation-al variables significantly improved the model.

Variables	CLB	TV	SEF	MC	CT	SEM	EL
CLB	-	-	-	-	-	-	-
TV	0.204	-	-	-	-	-	-
SEF	0.345	0.450	-	-	-	-	-
MC	0.260	0.201	0.280	-	-	-	-
CT	0.204	0.192	0.340	0.584	-	-	-
SEM	-0.001	0.297	0.111	0.358	0.211	-	-
EL	0.203	0.137	0.219	0.452	0.538	0.174	-
AAC	0.222	0.432	0.546	0.309	0.314	0.15	0.171

Table 2: Correlation matrices of variables in the study.

Model	R	R^2	Adjusted R^2	Std. Error of the Estimate	Change Statistics				
					R^2 Change	F Change	df1	df2	Sig. F Change
1	0.357[a]	0.128	0.09	13.19101	0.128	3.366	4	92	0.013
2	0.601[b]	0.362	0.312	11.47186	0.234	10.88	3	89	0

Table 3: Summary of hierarchical regression analysis of predicting academic achievement from self-regulation and motivational variables. **Note:** a: Predictors: (Constant), Study environment management, elaboration, Metacognitive strategy use, CT; b Predictors: (Constant), Study environment management, elaboration, Metacognitive strategy use, CT, Control of learning belief, Task value, Self-efficacy.

The structural relationship between students' motivational beliefs Self-Regulated Learning (SRL) strategies and their academic performance. Whether cognitive and metacognitive learning strategies have mediating effect between motivational beliefs and students' academic performance, structural equation modeling was utilized. First, the indirect phase from motivational beliefs through learning strategies to academic achievement was tested. Then the initial model was extended to include direct relationships be-tween motivational beliefs and academic performance to examine the direct impact of motivational beliefs on academic performance. The fit indices (CFI=0.994, TLI=0.967, RMSEA=0.046) show that the model satisfactorily suited the data when direct connections were included in the structural equation model. A closer look at the output's modification indices revealed that some of them exceeded the minimum value (i.e., 4), proving that the addition of direct paths from the motivational beliefs greatly enhanced the structural model's hypothesized properties. The addition of a direct path resulted in a chi-square change of 29.99, which was statistically significant (p=0.001). This demonstrated that motivated beliefs directly affect students' performance. The direct and indirect effects of self-regulatory components and motivational beliefs on the performance of the first-year student, regression weights were assessed as shown in Figure 2.

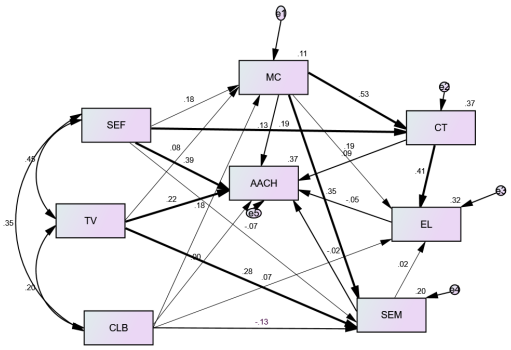

Figure 2: Model showing the direct and indirect effect of students' motivational beliefs on their academic success. **Note:** Structural Equation Modeling (SEM); Self-Evaluation Form (SEF); Critical Thinking (CT); English Learner (EL); Canadian Language Benchmark (CLB); Television Viewing (TV); Multiple Choice (MC); Automated Clearing House (AACH).

Self-efficacy belief (β=0.39, P=0.010) and ask value belief (β=0.224, P=0.039) had a significant direct contribution to students' academic performance. Again, self-efficacy belief (β =0.19, P=0.040) and task value belief (β=0.228, P=0.047) respectively had a significant direct contribution to critical thinking and study environment management skills while metacognitive strategy uses directly contributed to critical thinking (β=0.53, P=0.010) and study environment management skill (β=0.35, P=0.010). Critical thinking affected elaboration with (β=0.41, P=0.011). Self-efficacy belief (β=0.151, P=0.010) and metacognitive strategy use (β=0.225, P=0.013) had a significant indirect contribution to elaboration. The total effect of Self-efficacy belief on Critical thinking (β=0.29, P=0.010) elaboration (β=0.29, P=0.010) and the total effect of task value on study environment management skill (β=0.31, P=0.028 were statistically significant. Lastly, metacognitive strategy uses had a significant direct effect on Critical thinking (β=0.53, P=0.010), and study environment management skills (β=0.35, P=0.010). The total effect of self-efficacy on students' academic performance was very high (β=0.443, P=0.010) followed by task value belief (β=0.232, P=0.029).

However, Control of learning belief was found to have no direct effect on students' academic performance while the direct contribution of metacognitive strategy use (β=0.128, P=0.373), study environment management skill (β=0.017, P=0.840), critical thinking (β=0.094, P=0.427), and elaboration (β=0.050, P=0.680) were not statistically significant. Similarly the indirect contribution of Control of learning belief (β=0.026, P=0.194), self-efficacy belief (β=0.043, P=0.309), and task value belief (β=0.007, P=0.825) were not statistically significant.

This result generally implies that motivational beliefs significantly influence students' academic performance both directly and indirectly through the mediating role of cognitive and metacognitive learning strategies. The contract variable in the model explained 37% of the variance in student's academic performance with self-efficacy (β=0.39), task value belief (β=0.22), metacognitive strategy use (β=0.13), and critical thinking (β=0.09) not Control of learning belief (β=0.0), study environment management skill (β=-0.02) and elaboration (β=-0.005)

DISCUSSION

This study examined the relationship between motivational beliefs, Self-Regulated Learning (SRL) strategies, and academic performance (measured by psychology course achievement) in undergraduate freshman students. To achieve this, hierarchical regression analysis and path analysis of structural equation modeling were applied.

According to the hierarchical linear regression results shown in Table 2, the linear combination of cognitive and metacognitive learning strategies explained about 12.8% (R^2=128, F(4,92)=3.366, P,=0.013) of the variance in performance in the psychology course, while the motivational components of learning accounted for about 23.4% (R^2=0.234, F(3,89)=10.880, P<0.01) of the variance in that course performance.

The addition of direct pathways from motivational beliefs to academic achievement significantly improved the hypothetical structural model. Motivational beliefs directly influence students' academic performance as well as cognitive and metacognitive learning strategies. The results were consistent with hypothesized theoretical models that the relationships between college students' motivation to learn and their use of self-regulation were positively associated with academic achievement [10,18]. However, some of our key findings, notably a significant direct contribution of students' self-efficacy and task value to academic performance were contradicted [14], stating that the relationship between students' motivational beliefs and academic performance was fully mediated through their learning strategies.

However, our result is consistent with the finding of Hayat, et al [25] that self-reported self-efficacy showed a direct, positive, and statistically significant effect on school performance and metacognitive learning strategies, and Shehzad, et al [6] whose results support this also, resource management learning strategies fully mediated the relationship between achievement goals and academic performance, but cognitive/metacognitive learning strategies did not mediate the relationship between achievement approach goals and academic performance. This means that freshmen who value their education and have confidence in their abilities are more likely to be independent and perform better academically [26,27].

CONCLUSION

One of the more significant findings of this study is that freshmen who value their education and have confidence in their abilities are more likely to achieve higher academic achievement. Therefore, it is critical for the Freshman Directorate's Office to develop interventions that promote students' academic motivation and metacognitive approaches to learning. In particular, providing basic training that increases their perceptions of self-efficacy in their learning would have a significant positive impact on student's academic performance.

LIMITATIONS

This study is not without limitations. First self-report data and individual course performance measures of a small sample of participants, reached on a convenient basis from only one university limit the generalizability of the studies to Ethiopian higher education institutions. Second this study had limitations in conducting factorial analysis, which would have been useful to extract general and domain-specific dimensions of motivation and self-regulation in the context of current college entrants. Therefore, future research should include cumulative academic measurements of large numbers of participants from different universities subjected to factor analysis to address this limitation. Factorial Analysis of Variance (ANOVA) allows researchers to examine the individual main effect of all motivational and self-regulatory dimensions and their interaction effect on the academic performance of students at different academic levels in different institutional settings

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