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Meta-cognitive self-regulated learning and motivational beliefs as predictors of college students' performance

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Abstract: This study examined the predictive association between meta-cognitive self-regulated learning, motivational beliefs and United Arab Emirates (UAE) college students' academic performance. The research participants included 404 college students enrolled in a variety of general education courses at Al Ain University of Science and Technology in the UAE. Data were collected via seven subscales of the Motivational Strategies for Learning Questionnaire (MSLQ) and was subjected to the following analysis: exploratory factor analysis of the 43 items of the MSLQ, multiple analyses of variance (MANOVA), and regression analysis. Analysis of the data revealed that four of the independent variables (intrinsic goal orientation, self-efficacy, test anxiety, and meta-cognitive self-regulated learning) were found to be significant predictors of college students' performance. Implications for instruction and college counseling are discussed.
Keywords: Motivational beliefs, self-regulated learning, self regulation, self efficacy, college students' achievement.

Introduction

Knowing the factors that influence college students' academic performance is necessary to improve their learning. In previous studies, several factors have been found to be important in influencing academic performance. Research demonstrates that students' motivational beliefs and self-regulated learning are directly related to their academic performance (i.e., Pintrich & de Groot, 1990; Zimmerman & Martinez-Pons, 1990).

Steffen (2006) suggested that self-regulated learning has become an important topic in educational and psychological research. One reason for this is that the extent to which learners are capable of regulating their own learning greatly enhances their learning outcomes. Pintrich (2000) defined self-regulated learning as, "an active, constructive process whereby learners set goals for their learning and then attempt to monitor, regulate, and control their cognition, motivation, and behavior, guided and constrained by their goals and contextual features of the environment" (p. 435) . Pintrich and de Groot (1990) stated that self-regulated learning conjoins three major constructs; students' meta-cognitive strategies for planning, monitoring, and regulation, students' management and control of their effort on classroom academic material, and cognitive strategies that students use to learn, remember, and understand the material.

It is widely accepted that students who are able to successfully regulate their effort initiate learning tasks, set goals, decide on appropriate strategies to achieve their goals, then monitor and evaluate their progress will likely do better than

students who do not (Pintrich, 2003). However, possessing knowledge of cognitive and meta-cognitive self-regulated learning strategies is not enough to enhance student learning and academic performance; students must also be motivated to use their meta-cognitive strategies to build upon their understanding of instructional material (Pintrich, 2000).

Pintrich & Schunk (2002) define motivation as "the process whereby goal-directed activity is instigated and sustained" (p. 5). According to Pintrich (1999) motivation is the most important component of learning in any educational environment. It is considered to be one of the best determining factors of students' success.

There are several theoretical models proposed about motivational beliefs. In this study, the theoretical framework for students' motivation was the general expectancy-value model of motivation. The model proposed that there are three motivational components: value components that include goal orientation and task value; expectancy components that include self-efficacy, and control beliefs; and the effective construct of test anxiety (Yukselturk & Bulut, 2007).

Based on Yukselturk & Bulut's (2007) theoretical framework, motivational beliefs focused on in this study were intrinsic goal orientation, extrinsic goal orientation, task value, control of learning beliefs, self-efficacy for learning and performance and test anxiety. However, studies indicate the importance of intrinsic and extrinsic goal orientation. Generally, researchers agree that an intrinsic goal orientation leads to better performance than an extrinsic goal orientation (Miltiadou & Savenye, 2003). Intrinsic goal orientation refers to the drive inherent in an activity itself, as when the student engages in an activity for its own sake, the enjoyment it provides, the learning it permits, or the feelings of accomplishment it evokes.

Extrinsic goal orientation, on the other hand, represents the degree to which the student participates in order to achieve a goal through the completion of the activity. Therefore, an extrinsically motivated student performs because of rewards and/or punishments external to the activity itself. Pintrich (1999) found that students who were more highly intrinsically motivated performed better academically.

Task value refers to the student's opinion of the appeal, importance, and usefulness of the task. High task value should lead to more involvement in a student's learning. Pintrich's research indicated that task value beliefs were correlated positively to performance, albeit these relations were not as strong as those for self-efficacy (Pintrich, 1999).

Control of learning refers to students' beliefs that their effort to learn will result in positive outcomes. If students believe that their efforts to study make a difference in their learning, they should be more likely to study strategically and effectively.

Self-efficacy for learning and performance refers to students' beliefs about their ability to effectively apply knowledge and skills that they already possess to novel situations which in turn create new cognitive skills (Schunk, 1989). Self-efficacy has also been shown to be a powerful determinant of academic achievement (Pintrich & de Groot, 1990; Lynch, 2006). Moreover, self-efficacy beliefs have greater predictor value of learning and achievement outcomes in various cognitive domains as compared to other motives, such as task value or test anxiety (Pajares & Valiante, 1999).

Test anxiety is a worry, or a cognitive component which refers to students' negative thoughts that disrupt performance, and emotional components which refer to affective and psychological arousal aspects of anxiety. Higher levels of test anxiety are related to lower levels of performance on exams. Many researchers (e.g., Pintrich & de Groot, 1990; Zeidner & Matthews, 2005) indicate that test anxiety encompasses phenomenological, physiological and behavioral responses to assessment procedures and can create adverse reactions leading to lower than expected academic performance.

Regarding gender differences in motivational beliefs and self-regulated learning, research has shown that males tend to overestimate their abilities more than females do in various domains (Pajares & Valiante, 1999). In general, female students are identified as possessing higher ratings of test anxiety (Pintrich, 1989).

There is considerable research documented that motivational beliefs and self-regulated learning of high school and college students are associated with various measures of academic achievement. For example, Lynch (2006) evaluated the ability of the Motivated Strategies for Learning Questionnaire (MSLQ) subscales to predict course grades by incorporating a stepwise multiple regression procedure. Lynch's results showed that the subscales self-efficacy and external goal orientation yielded significant results. Utilizing the revised version of MSLQ on a sample comprised of 103 undergraduate students in a university in North Carolina, Klomegah (2007) found that college students' self-efficacy strongly correlated with academic performance.

Yukselturk & Bulut (2007) used four online questionnaires (Demographic Survey, Internal-External Locus of Control Scale, Learning Style Inventory, and the MSLQ) with a sample that included 80 students who attended an online computer programming course at Middle East Technical University in Ankara. The statistical results of the study indicated that the effect of self regulation variables on students' success was statistically significant, and the interview results indicated that successful students generally used self-regulated learning strategies. Utilizing the modified version of the MSLQ, de Groot (1990) used zero order correlations to consider the association between students' performance

indicators and motivational components and self-regulatory learning components, followed by a regressional analysis. In Pintrich and de Groot's study, the MSLQ measures of self regulation, self-efficacy and test anxiety were significantly predictors of students' performance.

Niemczyk & Savenye's (2005) findings indicated that extrinsic goal orientation and self-efficacy were positively related to course grades, while test anxiety was negatively related to course grades. Niemczyk & Savenye's study participants consisted of 193 females and 98 males. The instrument of their study was the MSLQ. Mousoulides & Philippou (2005) examined the relationship between motivational beliefs, the use of self regulation strategies, and mathematics achievement in Cypriot pre-service teachers. They used a modified version of MSLQ and a mathematic achievement test. Their findings showed that self-efficacy is a strong predictor of mathematics achievement, and that the use of self-regulation strategies had a negative effect on achievement.

A study of self-efficacy as a predictor of academic performance in science, involved a cohort of first-year students enrolled in nursing program at the University of Wollongong in Australia (Andrew, 1998). The study instrument used was Self-efficacy for Science (SEFS). The findings showed that the science self-efficacy predicted 18.5% of the academic performance in bioscience subject. Many researchers stated that self-regulated learning affects students' academic performance; however, some researchers found that there is no statistically significant relationship between self-regulated learning and students' academic performance (i.e., Mousoulides & Philippou, 2005).

The contradictory results of studies about the effect of self-regulated learning and motivational beliefs on college students' performance emphasize the need for additional research on this topic. While the concepts of self-regulated learning and motivational beliefs have stimulated considerable empirical research in many countries, no research on these variables have been undertaken in the UAE

Therefore, the aim of this study was to investigate how college students' academic performance can be explained in terms of the following variables: gender, motivational beliefs (intrinsic goal orientation, extrinsic goal orientation, task value, control beliefs, self-efficacy, and test anxiety), and self-regulated learning. The results of this study might encourage institutions of higher education in the UAE to implement procedures in order to design high-quality learning environments through early intervention. More specifically, the present study addresses the following major questions:

1) What is the extent to which the following variables (intrinsic goal orientation, extrinsic goal orientation, task value, control beliefs, self-efficacy, and test anxiety) account for college students' course scores?

2) To what extent do scores of college students self-regulated learning and factors of motivational beliefs predict academic performance?
3) Are there significant differences in meta-cognitive self-regulated learning, motivational beliefs and students' course grade due to student gender?

Based on social learning theory, it was expected that there would be a significant relationship between self-regulated learning, motivational beliefs and students' course scores. Hence it was assumed that students who have high levels of motivational beliefs and self-regulated learning would likely achieve elevated academic scores relative to their peers with lower levels. Significant association between gender and self-regulated learning and motivational beliefs was also expected.

Method

Sample

The participants of this study included 404 students who, in 2007, studied at Al Ain University of Science and Technology and who were enrolled in five General Education courses at the Al Ain city campus in the UAE. The sample included 204 males (50.5%) and 200 females (49.5%) ranging in age from 19 to 38 years of age. Most (63.1%) (n=255) of the participants were in their first year of university. An additional 98 (24.3%) were in their second year and the remaining participants 51 (12.6%) were in at least their third year of study. They were representative of five colleges as follows: 190 (47%) in Business Administration; 98 (24.2%) in Education; 26 (6.4%) in Information Technology; 55 (13.6%) in Law; and 35 (8.7%) in Pharmacy. Demographic variables were collected.

Instrumentation

A demographic survey was used to collect students' demographic information. Final course grades were used as the measure of students' academic performance. Instructors provided percentage scores in addition to letter grades. Based on a four-point grading scale, the following scale was used to report final course scores: A = 4.00 (90-100%); B+ = 3.5 (85-89%); B = 3.00 (80-84%); C+ =2.5 (75-79%); C = 2.00 (70-74%); D+ = 1.5 (65-69%); D = 1.5 (60-64%); and F = 0 (0-59%).

The adapted version of the relevant sections from the MSLQ (Printich, Smith, Garcia, and McKeachie, (1991) was used in this study to collect data related to meta-cognitive self-regulated learning and motivational beliefs.

The original form of the MSLQ is a self-report instrument designed to measure college students' motivational orientations and their use of different learning strategies. The motivational section of the MSLQ consists of six subscales with items designed to assess students' goals and beliefs for a course, their beliefs about their skills to succeed in a course, and their anxiety about tests in a course. The learning strategy section consists of nine subscales with items regard students' use of different cognitive and meta-cognitive strategies as well as management of various resources. In this study, the six sub-scales of motivational section, and one subscale (meta-cognitive self-regulation) from the learning strategy section were used. The authors of the MSLQ completed a number of statistical tests to determine the reliability and validity of their instrument. Following the factor analyses, the authors calculated internal consistency estimates of reliability (Cronbach's alpha) and "zero-order correlations between the different motivational and cognitive scales" (Pintrich et al., 1993, p. 806). The majority of the Cronbach's alphas for the individual subscales (9 out of 15) were fairly robust (i.e., they were greater than .70, with the largest one, self-efficacy for learning and performance, being .93). The Cronbach's alphas for the remainder of the subscales fell below .70 (with the lowest one, help seeking, coming in at .52).

The MSLQ was translated into Arabic using independent back-translation. The 43 items were translated into Arabic by a native Arabic speaker then translated back into English by a bilingual native English speaker who was not part of the research team. A second native English speaker, unfamiliar with the study, reviewed the two English versions to ensure their equivalence. Some items of the scale were lightly adjusted to ensure applicability to all students. These changes were intended to ensure that the modified statement was readily understandable to respondents. The subscales of the MSLQ consisted of 43 items which are distributed among the 7 subscales.

In the current study, internal reliability coefficients (Cronbach's alpha) which ranged from .72 to .87 for each of the seven scales were calculated. Table 1 lists the MSLQ scales and their internal consistencies as measured by Cronbach's alpha. To ensure the reliability of the sub-scales of the MSLQ which was used in this study, they were applied in a pilot study twice, with a two week interval, to 35 college students who were outside the sample, but who had its characteristics. The Pearson correlation coefficient between the results of the two applications was .84.

A brief description of the sub-scales that were used in this study is as follow:

1- The 4 items of the intrinsic goal orientation scale assessed the degree to which learners perceived themselves to be engaged in academic tasks in order to meet a personal challenge, satisfy personal curiosity, and/or attain personal

mastery over the elements of the task (e.g., "in a class like this, I prefer course material that arouses my curiosity, even if it is difficult to learn").
2- The 4 items of extrinsic goal orientation scale assessed the degree to which a student participates in a course for the reason that it is a means to an end such as performance, rewards, promotion, and approval from others (e.g., “the most important thing for me right now is improving my overall grade point average, so my main concern in this class is getting good grades).
3- The 6 items of the task value scale measured students' assessments regarding how interesting, important, or useful they perceived the course to be (e.g., “it is important for me to learn the course material in this class").
4- The 4 items of the control of learning scale measured the extent to which students believed that their academic performance was dependent on factors they controlled, such as the amount of their study or effort (e.g., “it is my own fault if I don't learn the material in this course").
5- The 8 items of the self-efficacy scale measured the extent to which students believed that they were competent in terms of task-related abilities and skills and had a high likelihood of a successful academic performance (e.g., “I believe I will receive an excellent grade in this class").
6- The 5 items of the test anxiety scale assessed the extent to which students experienced discomfort or had negative thoughts that could interfere with their test performance (e.g., “when I take a test, I think about items on other parts of the test I can't answer").
7- The 12 items of the meta-cognitive self-regulated learning scale assessed the degree to which the students monitor and regulate their use of cognitive state (e.g.," when I become confused about something I'm reading for this class, I go back and try to figure it out ") (Lynch, 2006).

Procedure

Data was collected during the fall 2007 academic semester. After informed consent had been obtained, the 43-item instrument was administered. The subjects received written instructions that specified the purpose of the study and explained the procedures to be followed in responding to the items. The dependent variable (students' academic performance in the form of the final course grades at the end of the semester) was collected from the course instructors.

Correlation and regression tests were used to analyze the data. Descriptive statistics, such as mean standard deviations of subjects, were calculated for the scale scores. The MSLQ sub-scale scores for each participant were constructed by taking the mean of the items that make up that scale. For example, the self-

efficacy scale has eight items; summing the eight items and taking the average computed as a participant's score for self-efficacy. For negatively worded items, the ratings were reversed. In general, a higher score such as 4, 5, 6, or 7 is better than a lower score like a 1, 2, or 3. The only exception is test anxiety scale, where a high score means more worrying (Pinrich et al,. 1991).

Results

The number of items, means, standard deviations, and reliability coefficient (Cronbach's alpha) for each of the 7 subscales of the MSLQ are presented in Table 1. When the internal consistency of the MSLQ for the participants of this study was analyzed, it was found that the results were approximately similar to those reported in the User's Manual for most of the subscales. As shown in Table 1, these reliabilities ranged from .72 to .87. However, all the resulting reliabilities seem to be acceptable for the purposes of the study.

Table 1
Number of items, means, and reliability coefficient (Cronbach's alpha) for males and females students (N, 404)

MSLQ Scales	Items No.	Gender			α
		Men	Women	Total	
Intr	4	4.62	4.78	4.70	.77
Extr.	4	5.70	5.65	5.67	.72
Taskv	6	5.47	5.70	5.59	.87
Cont	4	5.48	5.67	5.57	.74
Selfef	8	5.17	5.44	5.30	.85
Tanx	5	4.19	3.85	4.02	.79
Mcg	12	4.78	5.13	4.96	.83

Factor analysis (principal components with Oblimin and Kaiser normalization rotation) was conducted to check whether the expected factor structure was upheld when the scales were translated into Arabic. Missing values were replaced with the item mean. Items which did not load on any factor above the 0.40 level were eliminated from further analyses. Items with a loading greater than .40 on a particular factor were identified as loading on that factor. The eigenvalues of the 7 factors over 1 were extracted, and factor loadings of the items were found to be 0.45 for one component, and 0.57 or

higher for all the remaining components. The amount of total variance explained by the 7 factors was 62.94%. Chi-Square value (X^2= 835.213, N= 404, df = 294, p = 001) which was calculated for the adaptive version of MSLQ found to be significant and had acceptable fit.

It was found that most of the loadings were substantial, indicating that the factor structure as hypothesized by Pintrich et al. (1991) is supported, and that the observed variables are good indicators of their respective variables. Pearson correlations were conducted to examine the interrelationships among the scales. As can be seen from Table 2, the correlations among the seven factors were between 0.1 and 0.45. The correlations revealed that there were no high correlations among the scales, indicating that there is no redundancy.

Table 2
Pearson's correlation coefficient between the 7 scales of MSLQ

	1	2	3	4	5	6
Intr						
Extr.	.13					
Taskv	.27	.07				
Cont	.15	.02	.27			
Selfef	.40	.37	.35	.37		
Tanx	-.06	.11	-.05	-.06	-.11	
Mcg	.32	.14	.36	.25	.44	.01

To determine the statistical significance of differences in gender on students' motivational beliefs and self-regulated learning, the data was analyzed using multivariate analysis of variance (MANOVA). MANOVA was performed with the 7 subscales of MSLQ as dependent variables, and gender was the Independent variable. The results for the MANOVA procedure with the use of Wilk's Lambda criterion demonstrated that the combined dependent variables were significantly affected by gender, ($F_{7, 404}$ = 2.65, p< .01 Wilk's Lambda = .96, η^2 = .04).

To investigate the impact of the main gender effects on the dependent variables, a follow up univariate F-test was performed. The main effect of gender at the multivariate level, follow up F-test indicated that this result could be attributed to significant differences between males and females on the self-efficacy, ($F_{1,404}$ = 6.85, p< .009), test anxiety ($F_{1,404}$ = 8.64, p< .003), and self-regulated learning ($F_{1,404}$ = 4.63, p< .03). Females reported higher levels than males on all of these subscales. As regards to strength of association of effect size for significant Fs, η^2 were ranged from .011 and .021.

Table 3
Summary of full model univariate of (N = 404)

Source	D. V.	SS	F1,402	Sig.
Gender	Intr	.005	.019	.890
	Extr.	.006	.274	.601
	Taskv	.079	.328	.567
	Cont	.15	.604	.438
	Selfef	1.68	7.025	.008
	Tanx	1.84	7.691	.006
	Mcg	2.95	12.318	.001

To test the main hypothesis of this study, a standard multiple regression was run with course scores as the dependent variable, and the seven scales of MSLQ as the independent variables. The analysis showed that the seven predictor variables accounted for 40.5% of the variance in course score, (R^2 = .405, $F_{7, 396}$ = 38.46, p< 001).

Four of the dependent variables were significant predictors of students' academic performance. Self-efficacy has the largest beta weight, ß = .285, p < .01 indicating that this variable made the strongest contribution to explaining the dependent variable variance (academic performance) when all other variables in the equation were held constant. The beta coefficient of meta-cognitive self-regulated learning was (ß =.232, p < .01) made it the second strongest contribution to explain the variance in the dependent variable. The third contributor to explain the dependent variable was intrinsic goal orientation with a beta weight of .224, p < .001, test anxiety was the fourth contributor with a beta weight of -.091, p < .02 indicated that it made less contribution than the other predictors. Three dependent variables were non-significant, ß-weights for extrinsic goal orientation, task value, and control beliefs were -.018, .025, and .011, respectively. Beta weights and indices are presented in Table 4.

Each uniqueness index indicates the amount of variance accounted for by a particular variable beyond that accounted for by the other variables. As illustrated in Table 4, self-efficacy uniquely accounted for 27.4% of the variance in course scores; meta-cognitive self-regulated learning accounted for 7.4%, intrinsic goal orientation accounted for 4.5%; and test anxiety accounted for .09% of the variance. The other variables included in the regression analysis, extrinsic goal orientation, task value, and control beliefs have no predictive values, all together accounted for less than1% of the variance. Their beta coefficient were -.018, .025, and .011 respectively.

Table 4
Summary of full model regression analysis for meta-cognitive self-regulated learning and motivational beliefs variables (N = 404)

Variables	B	SE	β	t	Sig.	R2	Adj. R2	F7,403
						40.5	.394	38.46
Intr	.139	.033	.224	4.257	.000			
Extr.	-.018	.022	-.033	-.827	.406			
Tskv	.025	.027	.044	.938	.349			
Cont	.011	.027	.018	.399	.690			
Selef	.189	.033	.285	5.708	.000			
Tanx	-.041	.018	-.091	-2.251	.025			
Mcg	.118	.023	.232	5.198	.000			

As shown in Table 1, the mean values indicated that women were relatively higher on intrinsic goal orientation, task value, control beliefs, self-efficacy and meta-cognitive self-regulation, while men are higher on extrinsic goal orientation and test anxiety.

Discussion

The main purpose of the current study was to investigate to which extent the use of self-regulated learning and motivational beliefs (intrinsic goal orientation, extrinsic goal orientation, task value, control beliefs, self-efficacy, and test anxiety) can predict college students' academic performance.

Consistent with the hypothesis of this study, previous research (e.g., Pintrich & de Groot, 1990), and efficacy theory (Bandura, 1986), this study revealed that self-efficacy was the strongest predictor of academic performance. It appears that the college students with higher self-efficacy beliefs have higher academic performance. Students with high levels of self-efficacy willingly choose challenging academic tasks and demonstrate more positive attitudes toward learning as evidenced by their higher academic aspirations, lower anxiety, and lower apprehension in academic contexts. Moreover, they use effective learning strategies (Pajares & Valiante, 1999).

With regard to self-regulated learning, the present investigation revealed that meta-cognitive self-regulated learning was one of the predictors of college students' academic performance. This finding is consistent with previous research (Zimmerman & Martinez-Pons, 1990; Pintrich & de Groot, 1990). However, this result was expected because self-regulated students, as Pintrich & de Groot, (1990) articulated, are more motivated to use planning, organizational, and self-monitoring strategies than less self-regulated students.

A large body of previous research (Lynch, 2006) demonstrates that learning is enhanced when students use organizational planning and self-monitoring strategies in their learning.

In line with the previous studies, the current study found that intrinsic goal orientation is one of academic performance predictors. This finding supports Rittman's (1999) assertion that psychological factors are important in understanding academic success. Moreover, intrinsic motivation theorists have long suggested that being interested and engaged in the process of education results in better learning and achievement.

This study found that test anxiety had a small negative effect on students' academic performance. This result can be interpreted in the framework of test anxiety theory. Test anxiety encompasses phenomenological, psychological, physiological and behavioral responses to assessment procedures and can create adverse reactions leading to lower than expected academic performance (Zeidner & Matthews, 2005).

Zeinder & Matthews (2005) argued that anxiety is likely to be caused by undue self-focus of attention and over-attention on outcome expectancies: the consequences of test anxiety can lead to blocking of knowledge. Additionally, students with high test anxiety have little to retrieve during the test because they suffer from difficulties in encoding and organizing the information in their long-term memory.

Based on the results of the present study, we can say that the UAE college students are more likely to obtain higher course scores when they possess intrinsic goal orientation, self-efficacy beliefs, self-regulated learning, and experienced low levels of test anxiety. It is hereby concluded that the four independent variables (intrinsic goal orientation, self-efficacy, self-regulated learning, and test anxiety) predict and influence academic performance. In addition, significant correlation exists among most of these predictors.

When the results of this study were assessed for gender differences, male and female students displayed significant differences in test anxiety, self-efficacy, and self-regulated learning. The results revealed that the female cohort attained higher means for all the three factors compared with their male counterparts. The same result was found in some previous studies (Zimmerman & Martinez-Pons, 1990).

It is possible that the Emirate female students enjoy learning more than males and that they exert greater effort in studying because they have a strong desire to obtain a college education (Semmar, 2006). According to the gender differences in test anxiety, the result of this study confirmed the findings of previous studies. Pajares & Valiante (1999) stated that female students are identified by most research as the group with higher ratings of test anxiety even

when their performance is equal or better than the performance of male students.

The results of the present study confirmed much of what the literature has established; namely, that self-efficacy, self-regulated learning, intrinsic goal orientation, and test anxiety are predictors of college students' academic performance. The findings of the current study suggest that success in college courses is dependent, partly, on the self-regulated learning, self-efficacy, and intrinsic goal orientation of the students. More specifically, it is the students' self-regulation, self-efficacy, and intrinsic motivation that are of most importance when predicting course scores.

The findings of this study provided a basis for some useful understanding of students' motivational beliefs and self-regulated learning. This understanding may help college students improve their achievement by training to be self-regulated learners, self-efficacious, and to enjoy their learning. Instructors should develop effective environments in which students can learn to regulate their learning processes, design tasks that help them develop their regulatory skills, and encourage them to keep their motivation at a high level through the help of instructional activities. College counselors should provide programs to reduce levels of students' test anxiety.

At the same time, the study provides an Arabic version of the MSLQ instrument. This instrument can be used by academic counselors at UAE colleges as a diagnostic and research instrument that can monitor students' development and identify problems early. That will help them to intervene in a constructive way to improve students' achievement, heighten motivation and develop self-efficacy beliefs and self-regulatory strategies.

While the result provided empirical evidence for the association between motivational beliefs, self-regulated learning and college students' academic performance, it is not without limitations. First, the use of course scores as a measure of academic performance may not truly reflect the effect of the independent variables. Future research should utilize students' GPAs as a measure of academic performance. Second, students may have answered the items of the questionnaire with what they desire to be. A future replication of the present study should utilize qualitative as well as quantitative approaches to explore issues not able to be obtained in a survey. Third, using an 8-item scale to measure goal orientation (intrinsic and extrinsic) might not be enough to provide sufficient reliability and validity of the survey. Future research should utilize a different questionnaire with more items.

Conclusion

A main contribution of the present study was to investigate whether or not there is an association between motivational beliefs, meta-cognitive self regulation and college students' academic performance. The results provided valid empirical evidence for the importance of both motivational beliefs and self-regulated learning components in academic performance.

The results indicated that self-efficacy was the strongest positive significant predictor of academic performance. This finding corroborated what others have said in that the beliefs people have about themselves are key components in determining their accomplishments.

The major educational implication of these results is that teaching learners how to engage in self-regulation and how to enhance their motivational beliefs could serve to increase their academic performance. Further investigations of students' motivational beliefs and self-regulated learning can be expected to help college students achieve success in their college courses.

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