
| RESEARCH ARTICLE

Exploring the Role of Self-Regulated Learning in Academic Achievement: Evidence from Sultan Moulay Slimane University

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| ABSTRACT

Among the most important topics discussed in universities are self-regulation and educational performance. The present study aimed to examine the relationship between self-regulated learning strategies and educational performance among EFL students in the English Department of the Faculty of Arts and Humanities at Sultan Moulay Slimane University, Beni Mellal, Morocco. This study employed a cross-sectional correlational design, involving 104 students selected through non-probability sampling. Data were collected using the Academic Self-Regulated Learning Scale (A-SRL-S). The analysis was carried out in multiple stages to ensure the reliability and validity of the instrument. Results revealed a statistically significant positive association between self-regulated learning with academic achievement within the sample. Self-regulated learning differed significantly across academic achievement groups, with a moderate effect size ($\eta^2 = 0.117$, explaining 11.7% of the variance). The study offers some implications for teaching to enhance students' self-regulated learning skills.

| KEYWORDS

Self-regulated learning; academic achievement; SRL strategies; social cognitive theory; Moroccan higher education; educational psychology

| ARTICLE INFORMATION

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1. Introduction

Type the text The capacity to manage emotions, thoughts and behaviors in order to achieve goals is referred to as self-regulation (Fujita, 2011). It is considered a fundamental component of human functioning and an important executive process that enables individuals to guide their actions and persist in goal-directed activities (Miyake et al., 2000; Barkley, 1997; Damasio, 1994; Baumeister et al., 1994). According to research in psychology, good self-regulators, defined as those who can effectively manage the impulses and circumstances that obstruct goal attainment, are healthier, more productive, and happier (Tangney et al., 2004). In educational psychology, self-regulated learning refers to the application of self-regulation to academic contexts. It involves students' ability to actively plan, monitor, and regulate their cognitive, motivational, and behavioral processes in order to achieve learning goals (Zimmerman, 2000; Pintrich, 2000; Winne & Hadwin, 1998).

Interest in self-regulated learning has increased significantly in recent decades, partly due to the growing importance of lifelong learning in modern societies. As knowledge economies evolve, individuals are increasingly required to acquire new skills independently and adapt to changing learning environments. Consequently, learning is no longer confined to formal educational settings but also occurs in informal contexts where learners must take greater responsibility for regulating their own learning processes (Beishuizen & Steffens, 2011). In this context, self-regulated learning has become a key construct for understanding how students successfully manage their academic tasks and develop autonomy as learners.

The transition to higher education represents a particularly demanding context in which self-regulated learning plays a crucial role. Compared with secondary education, university learning environments often require students to manage heavy workloads, multiple deadlines, and less structured learning conditions. Students are expected to independently organize their studies, monitoring their progress, and seek resources to overcome academic challenges. However, many students enter higher education without fully developed self-regulation skills, which can negatively affect their academic performance.

Although recent research has established positive associations between self-regulated learning and academic achievement among university EFL students (Omari & Arssi, 2024; Baissane & Zaid, 2025; Nadif, 2025, Baissane, 2026), the evidence remains limited regarding the multidimensional assessment of academic self-regulation using the Academic Self-Regulated Learning Scale (A-SRL-S) in this context. In particular, less is known about the psychometric performance and dimensional profile of the A-SRL-S and how its dimensions relate to and vary across levels of academic achievement.

The present study therefore extends existing research by examining the seven-dimensional structure of the (A-SRL-S), investigating differences in self-regulated learning across academic achievement groups, and examining the association between SRL and academic achievement among EFL students in the English Department of the Faculty of Arts and Humanities at Sultan Moulay Slimane University, Beni Mellal, Morocco. Specifically, the study examines whether self-regulated learning is significantly associated with academic achievement and whether SRL differ.

2. Literature review

2.1 Theoretical framework

Self-regulation is widely recognized as an essential aspect of human functioning. However, there is no universal consensus regarding its definition and conceptualization. The social cognitive perspective distinguishes itself from theoretical frameworks that conceptualize self-regulation "as a singular internal state, trait, or stage" that is either biologically predetermined or individually discovered (Zimmerman, 2000, p.13). Instead, it conceptualizes self-regulation as a set of context-specific, cyclical processes employed in the pursuit of personal goals. These processes extend beyond metacognitive knowledge and strategies to encompass emotional, behavioral, and motivational processes, underpinned by a robust sense of self-efficacy (Bandura, 1982). Within this perspective, self-efficacy plays a central role, as individuals' belief about their capabilities influence the goals they set, the effort they invest, their persistence in the face of challenges, and their overall performance.

To better understand how self-regulation operates at a functional level, Bandura (1991) proposes that it works through three main subfunctions: self-monitoring, self-judgment and self-reaction. Self-monitoring involves observing and tracking one's behavior, its determinants, and its effects, thereby providing information for establishing standards and evaluating progress toward them. Self-judgement serves to evaluate one's behavior against established standards, situational circumstances and the perceived value of activities. This evaluative process is closely linked to individuals' goal-setting practices and their outcome expectations, which refer to beliefs about the likely consequences of their actions. These comparisons give rise to self-reactions, the final subfunction, which involves individuals' affective responses to their evaluated performance (Bandura, 1991). Together, these interrelated processes illustrate the cyclical and self-reflective nature of self-regulation, where continuous feedback loops enable individuals to adjust their strategies and behaviors over time.

According to Bandura's social cognitive theory, human functioning is shaped by reciprocal interactions among personal, behavioral, and environmental factors, a principle referred to as triadic reciprocal causality (Bandura, 1986; Usher and Schunk, 2018). This principle highlights that self-regulation does not occur in isolation but is continuously influenced by external and internal factors. A key aspect of this theory is the role of socializing agents—such as parents, teachers, coaches, and peers—in the development of self-regulation. Through processes of observational learning and modeling, individuals acquire regulatory strategies by observing others' behaviors and the consequences of those behaviors. Thus, self-regulation is shaped not only by individual processes but also by social and contextual influences.

Within educational contexts, self-regulation is commonly conceptualized as self-regulated learning, which refers to learners' active control over cognitive, motivational, and behavioral processes in academic tasks. This conceptualization provides a link between the theoretical foundations of self-regulation and their application to academic learning. The present study adopts Bandura's social cognitive theory as its overarching theoretical framework because it provides a comprehensive account of how learners actively regulate their cognition, motivation, and behavior within interacting personal and environmental contexts. Bandura's social cognitive theory has also informed prominent models of self-regulated learning, including Zimmerman's model, which applies these principles to academic learning contexts.

2.2 Conceptual framework

Self-regulated learning (SRL) refers to a process in which learners actively direct their thoughts, behaviors, and emotions toward the attainment of their learning objectives (Zimmerman, 2000). It encompasses goal-oriented activities that learners initiate, adapt and sustain over time (Zimmerman, 2008). SRL involves the deliberate regulation of cognitive, motivational, behavioral, and emotional processes in pursuit of academic goals. In this sense, learning is not merely reactive but involves deliberate effort, strategic planning, and continuous self-monitoring. Learners engaged in SRL set goals, regulate their efforts, and adjust their strategies in response to feedback generated through monitoring, control and reaction processes.

SRL has attracted considerable attention in educational research because of its association with academic achievement and effective learning. It provides a framework through which learners can take control of their learning processes, while also offering educators practical guidance for fostering autonomy and strategic engagement. A variety of instructional techniques designed to enhance self-regulatory processes have demonstrated effectiveness across diverse contexts, including tutoring, computer-based learning environments, coaching sessions, and independent study (Zimmerman & Schunk, 2001). Although multiple models of SRL exist, their diversity allows researchers and practitioners to select frameworks that align with specific research aims and instructional contexts (Panadero, 2017). Regardless of the model adopted, the effective use of learning strategies remains central to promoting deeper and more meaningful learning outcomes.

Among the major models of SRL, Zimmerman's social cognitive model provides a comprehensive framework for understanding how learners regulate their learning across successive phases (Zimmerman, 2000; Schunk & Zimmerman, 2003; Zimmerman & Moylan, 2009). This model conceptualizes SRL as a dynamic and cyclical process. It comprises three interrelated phases: forethought, performance and self-reflection. In the forethought phase, learners engage in task analysis, goal setting, and strategic planning, supported by motivational beliefs that energize the learning process and influence the selection and use of learning strategies. In the performance phase (also referred to as volitional control), learners implement their plans, monitor their progress, and apply self-control strategies to sustain attention, engagement and motivation to complete the task. The final phase, self-reflection, allows learners to evaluate their performance, leading them to make attributions regarding their success or failure (Zimmerman, 1986). These attributions generate self-reactions that can influence how tasks are approached in future performances—either positively or negatively. These self-reactions can subsequently shape learners' future motivation, strategy use, and overall approach to learning.

In addition to its phased structure, SRL is operationalized through a range of strategies that learners employ to regulate their learning. Self-regulated learning strategies refer to the actions and processes learners employ to acquire knowledge or skills. These strategies reflect learners' agency, purpose, and instrumentality perceptions. They include organizing and transforming information, self-consequating, information seeking, and the use of rehearsal or mnemonic aids (Zimmerman & Martinez-Pons, 1986). Subsequent work (Zimmerman and Martinez-Pons, 1988) expanded their framework to include 14 distinct self-regulatory strategies. These categories include strategies such as goal-setting, environmental structuring, self-consequences (e.g., self-reward and self-punishment), and self-evaluation. Additional categories, informed by related theoretical perspectives, include organizing and transforming information (Corno & Mandinach, 1983), seeking and selecting information (Baird, 1983), and using mnemonic and rehearsal strategies (McCombs, 1984). Furthermore, the model incorporates strategies such as seeking assistance from others and reviewing previously collected materials, including class notes and annotations on reading texts (Wang, 1983). Collectively, these strategies reflect the range of processes through which learners regulate their learning activities.

While Bandura's Social Cognitive theory provides the overarching theoretical foundation of the study, Zimmerman's cyclical model is adopted as the primary conceptual framework for understanding self-regulated learning in the present study. The model provides a structured lens through which learners' goal-setting behaviors, strategy use and reflective practices can be examined. By drawing on this framework, the study examines the relationship between self-regulated learning and academic achievement, with self-regulated learning operationalized through the seven dimensions of the A-SRL-S developed by Magno (2010) on the basis of Zimmerman and Martinez-Pons's framework.

3. Methodology

3.1 Research approach and design

A quantitative approach is better suited to achieving the objectives of this research, as it allows the problem to be defined in clear, specific terms, thereby facilitating the pursuit of the stated objectives. The study follows a correlational research design in which the researcher investigates relationships among variables without controlling or manipulating any of them. The aim is to investigate the relationships between self-regulated learning and academic achievement.

3.2 Study population, setting and sample

The study adopts a non-random sampling method, specifically convenience sampling. It was conducted on 104 undergraduate students from the Faculty of Arts and Humanities in Beni Mellal, all enrolled in the English Department. The participants included both male and female students aged 18 and above. They were in their fifth semester, with some specializing in linguistics and others in literature. Overall, the sample was relatively homogeneous in terms of cultural background, demographic characteristics, and instructional exposure. Participation in the study was voluntary.

3.3 Variables

There are two variables in the study. The first variable is self-regulated learning, which can be treated as an ordinal variable because its values represent categories with an inherent ranking (strongly agree, agree, disagree, and strongly disagree). The second variable is academic achievement, which was measured as an ordinal variable through honors classifications: standard pass (10–12), honors (12–14), high honors (14–16), and highest honors (≥ 16).

3.4 Data collection instrument

The choice of data collection instruments hinges on the research objectives as well as the recommended instruments in the pertinent literature. Self-regulated learning is typically measured using self-report instruments (Panadero et al., 2016). A systematic review by Roth, Ogrin, and Schmitz (2016) identifies three types of tools: questionnaires, interviews, and the “think-aloud” method. The authors note that in the vast majority of studies on self-regulated learning, researchers use the first type. The Likert-scale questionnaire is widely acknowledged as a simple and reliable measurement technique (Royeen, 1985), making it effective for capturing and interpreting respondents’ perceptions (Subedi, 2016).

The instrument used to measure self-regulation was the Academic Self-Regulated Learning Scale (A-SRL-S), a self-report instrument designed to assess academic self-regulated learning. The scale is grounded in the self-regulated learning framework proposed by Zimmerman and Martinez-Pons (1986, 1988). The A-SRL-S, developed by Magno (2010, 2011), was designed to assess the self-regulatory practices of college students in higher education contexts. Furthermore, good evidence of validity and reliability has been established for the A-SRL-S. Each statement is rated using a four-point Likert scale ranging from “strongly agree” to “strongly disagree.” The instrument consists of seven factors: memory strategy (14 items), goal-setting (5 items), self-evaluation (12 items), seeking assistance (8 items), environmental structuring (5 items), learning responsibility (5 items), and planning and organizing (6 items).

Memory strategy is measured through fourteen statements indicating student-initiated efforts to memorize material by overt or covert practice, e.g., “I record the lessons that I attend to.”

Goal-setting is assessed through five statements that reflect students’ ability to set educational goals or subgoals and to plan the sequencing, timing, and completion of tasks related to those goals, e.g., “I plan the things I have to do in a week.”

Self-evaluation is measured through twelve statements indicating student-initiated evaluations of the quality or progress of their work, e.g., “I welcome peer evaluations for every output.”

Seeking assistance and information are measured through eight statements indicating student-initiated efforts to solicit help from peers and teachers as well as the use of a variety of sources and resources, e.g., “I take my own notes in class.”

Environmental structuring is measured through five statements indicating student-initiated efforts to select or arrange the physical setting to make learning easier, e.g., “I isolate myself from unnecessary noisy places.”

Learning responsibility is measured through five statements indicating student-initiated efforts to prioritize schoolwork and to prepare for class, e.g., “I do things as soon as the teacher gives the task.”

Planning and organizing is measured through six statements indicating student-initiated overt or covert rearrangement of instructional materials to improve learning, e.g., “I study at my own pace.”

As for the second variable, namely academic achievement, the present study uses concrete and consequential indicators of students’ academic achievement based on a 20-point grading scale. Students’ final average marks obtained for the Diplôme d’Études Universitaire Générales were collected. The DEUG grade is calculated as the overall average of validated modules over two years (S1–S4). This academic performance is expressed using an honors system. Items related to personal information were

also included in the questionnaire to gather background information about the participants, such as age, gender and academic field of study.

3.5 Administration of the A-SRL-S

Data were collected from EFL students at the Faculty of Arts and Humanities at Sultan Moulay Slimane University in Beni Mellal, Morocco, in 2025. The questionnaire was administered online, and a total of 104 responses were obtained. Before completing the questionnaire, participants were provided with information about the purpose and nature of the study and were informed that participation was voluntary. They were also informed that they could decline to participate or withdraw from the study without penalty. No personally identifying information was collected, and the data were treated confidentially and used solely for research purposes. The study received ethical approval from the Ethics Committee of Sultan Moulay Slimane University prior to data collection.

To optimize questionnaire responses and gather meaningful data aligned with the research objectives, it is important to select appropriate questionnaire distribution methods. The URL of the Google Form was sent to students via Facebook and WhatsApp groups of the designated university. The questionnaire was also sent to acquaintances who have contact with students in the English Department of the aforementioned university. As a result of these efforts, an adequate response rate was obtained.

3.6 Data analysis

The Statistical Package for Social Sciences (SPSS) version 26 was used to analyze the gathered data. The data were coded, entered, and double-checked for outliers or errors. Data were analyzed using several statistical procedures. Initially, descriptive statistics, including means, standard deviations, and frequencies, were computed to summarize participants' responses and examine the distribution and completeness of the data. Internal consistency reliability of the A-SRL-S was assessed using Cronbach's alpha for each subscale. To explore the underlying factor structure of the instrument, Principal Component Analysis (PCA) was conducted. Construct validity was evaluated using Composite Reliability (CR), Average Variance Extracted (AVE), and Maximum Shared Variance (MSV). Discriminant validity was assessed through inter-construct correlations. The overall fit of the measurement model was evaluated using absolute, incremental, and parsimonious fit indices. To examine differences in self-regulated learning across groups of academic achievement, a one-way analysis of variance (ANOVA) was conducted. Finally, to assess the relationship between self-regulated learning and academic achievement, correlation and effect size analyses were performed to determine the strength and magnitude of the association between variables.

4. Results

4.1 Descriptive analysis

The analysis of self-regulated learning strategies among 104 Moroccan students revealed that Learning Responsibility had the highest average scores, with means ranging from 3.69 to 3.78, indicating a strong sense of academic accountability (see table A1 in Appendix A). Seeking Assistance was also highly practiced ($M = 3.65$ to 3.74), showing students' tendency to rely on peer or teacher support. Self-Evaluation and Memory Strategies followed closely, with means between 3.48 and 3.76, reflecting effective use of reflection and memorization techniques.

In contrast, Goal Setting had the lowest average scores ($M = 2.30$ to 2.49), suggesting that students rarely engage in planning or setting academic objectives. Organizing strategies were similarly underused, with means between 2.69 and 3.01 and standard deviations above 1.0, indicating inconsistency and limited application. Environmental Structuring showed moderate use, with mean values ranging from 3.23 to 3.73.

These results suggest that Moroccan students predominantly rely on reactive and interpersonal learning strategies, while underutilizing proactive techniques like planning and organizing. Educational support aimed at enhancing goal-setting and organizational skills could help improve overall academic self-regulation.

4.2 Principal Component Analysis (PCA)

The Principal Component Analysis (PCA) conducted on the Academic Self-Regulated Learning Scale (A-SRL-S) within this context confirmed the factorial structure and internal consistency of seven self-regulated learning components. All constructs demonstrated strong sampling adequacy, with Kaiser-Meyer-Olkin (KMO) values ranging from 0.808 to 0.926, and Bartlett's tests of sphericity significant at $p < 0.001$, validating factorability (see table A2 in Appendix A).

The Learning Responsibility factor achieved the highest explained variance at 90.693%, followed by Seeking Assistance (87.516%), Self-Evaluation (77.575%), Memory Strategy (76.884%), and Environmental Structuring (76.657%). Goal Setting and Organizing reported slightly lower explained variances at 69.554% and 63.888%, respectively. All item communalities were

satisfactory (mostly above 0.7), and factor loadings were robust across all dimensions (commonly exceeding 0.80), indicating a strong relationship between items and their corresponding latent variables.

Internal consistency was excellent for all factors, with Cronbach's Alpha values ranging from 0.886 (Organizing) to 0.979 (Seeking Assistance). This highlights the high reliability of each construct. In particular, Memory Strategy ($\alpha = 0.976$) and Learning Responsibility ($\alpha = 0.974$) further underscore the instrument's psychometric strength within this setting.

4.3 Construct validity analysis

The construct validity of the Academic Self-Regulated Learning Scale (A-SRL-S) was assessed through Composite Reliability (CR), Average Variance Extracted (AVE), Maximum Shared Variance (MSV), and discriminant validity via inter-construct correlations.

All constructs demonstrated excellent internal consistency, with CR values ranging from 0.887 (Organizing) to 0.980 (Seeking Assistance)—well above the recommended threshold of 0.70. Similarly, AVE values exceeded the 0.50 criterion for all constructs, ranging from 0.568 (Organizing) to 0.884 (Learning Responsibility), confirming strong convergent validity (see table 1).

Table 1

Reliability and validity assessment of the factor structure

	CR	AVE	MSV	MaxR(H)	MS	SE	SA	ES	LR	ORG	GS
MS	0,977	0,752	0,734	0,981	0,867						
SE	0,974	0,757	0,738	0,98	0,793***	0,87					
SA	0,98	0,859	0,71	0,982	0,831***	0,820***	0,927				
ES	0,928	0,723	0,536	0,946	0,792***	0,684***	0,835***	0,85			
LR	0,974	0,884	0,738	0,979	0,836***	0,859***	0,888***	0,849***	0,94		
ORG	0,887	0,568	0,31	0,89	0,871***	0,781***	0,905***	0,908***	0,883***	0,753	
GS	0,891	0,621	0,31	0,892	0,696**	0,526**	0,543**	0,594**	0,560**	0,557***	0,788

Significance of Correlations:

** $p < 0.010$

*** $p < 0.001$

Note. CR = Composite Reliability, AVE = Average Variance Extracted, MSV = Maximum Shared Variance; MaxR(H) = Maximum Reliability

In terms of discriminant validity, most constructs met the Fornell-Larcker criterion, whereby the square root of AVE (diagonal, bolded) exceeds the inter-construct correlations. For instance, Memory Strategy (AVE = 0.752, $\sqrt{\text{AVE}} = 0.867$) is higher than its highest shared variance with Learning Responsibility ($r = 0.836$). Similarly, Self-Evaluation ($\sqrt{\text{AVE}} = 0.87$) showed acceptable separation from other factors, despite moderately high correlations with Learning Responsibility ($r = 0.859$) and Seeking Assistance ($r = 0.820$).

The only notable exception is the strong inter-correlation between Learning Responsibility and other constructs, especially Seeking Assistance ($r = 0.888$) and Self-Evaluation ($r = 0.859$), where MSV (0.738) equals or slightly exceeds the AVE of some factors. This suggests some overlap between these constructs, although it does not invalidate the model given the theoretically close relationship between responsibility, help-seeking, and reflective evaluation in self-regulated learning. Moreover, Maximum Reliability (MaxR(H)) values ranged from 0.89 to 0.982, further confirming construct stability and supporting the robustness of the factor structure.

Overall, the A-SRL-S demonstrates strong convergent validity, high reliability, and acceptable discriminant validity, confirming the psychometric soundness of the instrument in this sample (see figure A1 in Appendix A1).

4.4 Model fit evaluation

The overall fit of the measurement model was evaluated using a combination of absolute, incremental, and parsimonious fit indices, all of which indicated an acceptable to good model fit.

Among the absolute fit indices, the Goodness-of-Fit Index (GFI) was 0.860, and the Adjusted GFI (AGFI) was 0.880, both approaching the conventional threshold of 0.90, which suggests a reasonably good fit to the data. The Standardized Root Mean Square Residual (SRMR) was 0.074, below the cutoff of 0.08, indicating low residual differences between the observed and

predicted correlations. Additionally, the Root Mean Square Error of Approximation (RMSEA) was 0.062, with values below 0.08 considered acceptable and those below 0.06 indicating a close fit (see table 2).

Table 2

Fit indices of the seven-factor model of the A-SRL-S

Absolute Fit Indices	GFI	0,860
	AGFI	0,880
	SRMR	0,074
	RMSEA	0,062
Incremental Fit Indices	NFI	0,880
	TLI	0,910
	CFI	0,921
Parsimony Fit Indices	χ^2/df	1,910
	AIC	1063,73

Regarding incremental fit indices, the Normed Fit Index (NFI) and Tucker-Lewis Index (TLI) were both 0.880 and 0.910, respectively, while the Comparative Fit Index (CFI) reached 0.921. These values, especially CFI and TLI, exceed the threshold of 0.90, indicating good improvement of the hypothesized model over a null model.

The parsimonious fit indicators also support model adequacy. The chi-square divided by degrees of freedom (χ^2/df) ratio was 1.910, well below the recommended upper limit of 3.0, indicating a parsimonious and efficient model. The Akaike Information Criterion (AIC) was reported at 1063.73, which is useful for model comparison in future studies.

In sum, the fit indices indicate that the seven-factor model of the A-SRL-S demonstrates an acceptable to good fit, supporting the validity of the factorial structure within the English Department of the Faculty of Arts and Humanities at Sultan Moulay Slimane University, Beni Mellal, Morocco.

4.5 Relationship between self-regulated learning and academic achievement

The current study sought to examine the association between self-regulated learning (SRL) and academic achievement and among EFL students at the Faculty of Arts and Humanities in Beni Mellal, with particular attention to differences in SRL across academic-achievement groups and the magnitude of these differences. The analysis was conducted on a sample of 104 students who completed the Academic Self-Regulated Learning Scale (A-SRL-S), which comprises seven distinct dimensions: Memory Strategy, Goal Setting, Self-Evaluation, Seeking Assistance, Environmental Structuring, Learning Responsibility, and Organizing.

A one-way ANOVA was performed to assess whether A-SRL-S scores differed significantly across four academic achievement groups: standard pass (10–12), honors (12–14), high honors (14–16), and highest honor (≥ 16). Levene's test indicated that the homogeneity of variances assumption was satisfied (all $p > .05$), validating the use of standard ANOVA procedures (see table 3).

Table 3

Assessment of A-SRL-S scores across academic achievement groups

	Levene Statistic	df1	df2	p-value
Based on Mean	2,003	3	100	0,118
Based on Median	1,721	3	100	0,167
Based on Median and with adjusted df	1,721	3	93,781	0,168
Based on trimmed mean	2,046	3	100	0,112

The ANOVA revealed a statistically significant difference in self-regulated learning across academic performance levels, $F(3, 100) = 4.431$, $p = .006$ (see table 4). This finding confirms that self-regulated learning is significantly related to academic achievement in this sample, thereby addressing and affirming the first research question.

Table 4*Statistical significance of the relationship between A-SRL and academic achievement*

ANOVA					
	Sum of Squares	Df	Mean Square	F	p-value
Between Groups	5,687	3	1,896	4,431	0,006
Within Groups	42,777	100	0,428		
Total	48,464	103			

4.6 Magnitude of the association between self-regulated learning and academic achievement

To assess the magnitude of the association between SRL and academic achievement, several effect-size indicators were examined. The eta-squared value was 0.117, indicating that approximately 11.7% of the variance in academic self-regulated learning (A-SRL-S) was associated with differences across achievement groups. This represents a moderate effect size. Supporting estimates, including epsilon-squared (0.091) and omega-squared fixed effect (0.090), further indicated a moderate effect. The random-effect omega-squared was lower (0.032), suggesting a smaller effect under the random-effects model. Overall, the findings indicate a meaningful association between SRL and academic achievement, with the magnitude of the association ranging from small to moderate across the effect-size estimates (see table 5).

Table 5*Effect size indicators for the association between SRL and academic achievement*

ANOVA Effect Sizes ^{a,b}				
		Point Estimate	95% Confidence Interval	
			Lower	Upper
Academic self-regulated learning (A-SRL-S)	Eta-squared	0,117	0,012	0,221
	Epsilon-squared	0,091	-0,018	0,198
	Omega-squared Fixed-effect	0,090	-0,018	0,197
	Omega-squared Random-effect	0,032	-0,006	0,075

a. Eta-squared and Epsilon-squared are estimated based on the fixed-effect model.

b. Negative but less biased estimates are retained, not rounded to zero.

Furthermore, psychometric evaluation of the A-SRL-S provided evidence of its structural and construct validity among EFL students in the present university context. Principal Component Analysis (PCA) supported the seven-factor structure, with each factor demonstrating strong factor loadings (most > 0.80), high communalities, and excellent internal consistency (Cronbach's alpha values ranging from 0.886 to 0.979). The construct validity analyses showed adequate discriminant and convergent validity across dimensions, although some overlap was noted between highly interrelated constructs such as Learning Responsibility, Self-Evaluation, and Seeking Assistance.

Taken together, the findings indicate that self-regulated learning is significantly associated with academic achievement and explains a moderate portion of its variance. The most utilized strategies (e.g., learning responsibility, help-seeking) appear to align with higher academic performance levels, while the underutilized planning and organizational strategies may represent areas for intervention.

5. Discussion

The present research indicates that the seven-factor structure of the A-SRL-S is both statistically sound and contextually appropriate, reinforcing its construct validity within the English department at the Faculty of Arts and Humanities at Sultan Moulay Slimane University, Beni Mellal, Morocco. The results of the study further suggest that self-regulated learning is associated with students' academic performance in this specific institutional setting. Similarly, Toor et al. (2024) employed a true experimental research design to examine the effects of self-regulated learning (SRL) strategies on students' academic achievement in learning the Chinese language. The findings revealed that self-regulated learning had a significant positive impact on students' performance, as learners who applied SRL strategies outperformed those taught through traditional instructional methods in Chinese language learning. Amri (2024) explored the role played by self-regulated learning (SRL) in academic achievement in the Tunisian EFL classroom. The study compares SRL strategy use and motivational beliefs across

learners with different achievement levels. Results indicated a positive relationship between SRL and academic performance, with high achievers employing SRL strategies more consistently. These findings place SRL as a key predictor of success and offer valuable insights for enhancing EFL teaching in Tunisia.

SRL differs significantly across academic-achievement groups, with higher levels of SRL being associated with higher academic achievement. This confirms Baissane and Zaid's (2025) study that investigated the relationship between SRL and academic achievement among Moroccan university students learning English as a Foreign Language, using a quantitative approach. A positive relationship was reported in which SRL constructs emerged as significant predictors of academic achievement, with the regression model explaining 18% of the variance, reflecting a moderate but meaningful influence. While this study presents the MSLQ as a measure of Moroccan EFL students' SRL and motivation, the Motivated Strategies for Learning Questionnaire was originally developed as a course-specific instrument, with respondents reporting their motivation and learning strategies in relation to a particular course. Consequently, interpreting its scores as representing students' general self-regulated learning and motivation across their academic experience may extend beyond the instrument's intended contextual scope. However, the Academic Self-Regulated Learning Scale (Magno, 2010) provides a general profile of students' self-regulated learning across any higher education context. Furthermore, Magno (2011) recommends using A-SRL-S as an alternative tool to the MSLQ and LASSI when measuring academic self-regulation.

Teachers can use SRL assessments as early indicators of which students need more academic support. Students who take ownership of their learning and seek help when needed perform better. These strategies reflect student agency, initiative and self-awareness which should be explicitly taught, modeled and encouraged. Help seeking ought to be reframed from being a weakness to being a smart learning behavior. Students are not using planning and organizational strategies extensively, which may be due to the fact that they have not been taught these strategies or do not perceive their value. Consequently, these students become priority targets for intervention. Teaching students how to plan their time, break down tasks and stay organized could significantly improve SRL and academic outcomes.

SRL is not limited to higher education but is relevant across different stages of academic development. Research involving secondary-school students demonstrates that SRL is also associated with academic achievement at lower educational levels, highlighting its broader relevance across the educational trajectory. Similarly, Bhagwat and Sadaphal (2024) investigated the relationship between self-regulated learning and academic achievement among 11th grade senior secondary students from the Nagpur and Wardha districts. The findings indicated a positive association between self-regulated learning and academic performance, highlighting the relevance of SRL to academic performance during adolescence.

Previous empirical research supports the premise that SRL processes significantly influence learners' academic achievement, cognitive functioning, behavioral engagement, and emotional regulation (Schunk & Zimmerman, 2008; Zimmerman & Schunk, 2011). This means that SRL should be treated as a core component of academic success. However, understanding SRL solely in terms of its academic outcomes overlooks the psychological and motivational processes that enable learners to regulate their learning effectively. As Zimmerman (1995) explains 'Self-regulation involves more than metacognitive knowledge and skill, it involves an underlying sense of self-efficacy and personal agency and the motivational and behavioral processes to put these self-beliefs into effect' (p. 217). In the same vein, Bandura (1991) states that 'Self-regulation also encompasses the self-efficacy mechanism, which plays a central role in the exercise of personal agency by its strong impact on thought, affect, motivation, and action' (p.248). Zimmerman (1995) argues that "to explain students' self-regulation failure as well as their successes in naturalistic settings, educational psychologists need to expand their views of self-regulation beyond metacognitive trait, ability, or stage formulations and begin treating it as a complex interactive process involving social, motivational, and behavioral components." (p.217).

6. Limitations

SRL does not operate in isolation but is embedded within a broader network of motivational, cognitive, behavioral, and contextual factors that may be associated with students' academic performance. The findings of the present study are consistent with this multifaceted nature of SRL; however, the use of the A-SRL-S necessarily limits the aspects of self-regulated learning examined in the study to the dimensions captured by the instrument. Consequently, other potentially relevant factors, such as self-efficacy, motivation, and contextual influences, were not directly assessed. Another limitation concerns the measurement of the second variable, academic achievement. Ideally, this variable should have been treated as a continuous measure to allow for more precise analysis. However, this was not feasible due to the low response rate when students were asked to report detailed achievement data. As a result, academic performance was operationalized using honors classification categories instead of a continuous scale.

The Academic Self-Regulated Learning Scale (A-SRL-S) has demonstrated acceptable psychometric properties in previous studies. In the present study, initial validation analyses – including principal component analysis, contrast validity assessment, and model fit evaluation – indicated that the instrument displayed acceptable internal structure within this Moroccan university context. However, the relatively small sample size and the fact that participants were drawn from a single university limit the generalizability of the findings to the broader Moroccan higher education context. Future research including students from multiple institutions and regions would help further establish the scale's validity and applicability.

Several other limitations should be acknowledged. Convenience sampling limits the representativeness and generalizability of the findings, while the EFL and English-department-specific sample restrict the transferability of the findings to other disciplines and contexts. The cross-sectional correlational design captures associations at a single point in time and does not establish temporal ordering or causality. Thus, the findings should be interpreted as evidence of relationships between SRL and academic achievement rather than causal effects.

7. Recommendations

This study reinforces the significance of promoting self-regulated learning techniques to enhance students' academic success, shedding light on this area as a critical focus for educators in supporting student development and achievement (Bibi et al. 2024; Toor et al. 2024; Bhagwat & Sadaphal, 2024; Amri, 2024; Baissane & Zaid, 2025). Some implications for teaching would be to integrate SRL development into curriculum, combine SRL training with other supports (self-efficacy and motivation, etc), and provide explicit instruction and practice in planning/organizing learning tasks. The study further emphasized the need for parents, educators, and policymakers to work collaboratively in encouraging goal-setting, time-management, and reflective learning practices among students. Zimmerman (2000) states that “dysfunctions occur because of the unfortunate reliance on reactive methods of self-regulation instead of proactive methods, which can profoundly change the course of cyclical learning and performance” (p.13). Educational support aimed at enhancing proactive strategies or forethought-phase strategies could help improve overall academic self-regulation.

8. Conclusions

This study sought to explore how self-regulated learning relates to academic achievement among EFL students in the English Department of the Faculty of Arts and Humanities at Sultan Moulay Slimane University, Beni Mellal, Morocco. The findings are intended to reflect patterns within this institutional context rather than to represent all higher education settings. The findings indicate a significant association between self-regulated learning and academic achievement in this sample. Learners who demonstrated stronger engagement in self-regulated learning strategies achieved higher academic results. Moreover, Self-regulated learning differed significantly across academic achievement groups, with a moderate effect size ($\eta^2 = 0.117$, explaining 11.7% of the variance).

The analysis further indicates that self-regulated learning is not just associated with achievement, but can be considered a meaningful contributor to students' academic success. By employing a validated measurement instrument and rigorous statistical procedures, the study ensured that the observed relationships were both reliable and theoretically informed. These results align with established models of self-regulated learning, supporting the notion that learners' ability to plan, monitor, and assess their own learning processes is necessary in higher educational contexts.

From a pedagogical perspective, the results highlight the significance of integrating self-regulated learning strategies into EFL instruction with a focus on the forethought phase and the use of proactive learning strategies to help students become more autonomous and academically accomplished. While the study was concerned with a specific institutional context, it suggests potential avenues for further research involving larger samples, different disciplines, and longitudinal designs to better understand how self-regulated learning develops over time and influences academic trajectories.

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Appendix A
Full Survey Items of the A-SRL-S

Table A1*Descriptive statistics for academic self-regulated learning across its factors*

Variables (Code)	Items	Mean	Std. Deviation	Analysis N
Memory Strategy (MS)	MS_1	3,74	0,776	104
	MS_2	3,64	0,835	104
	MS_3	3,76	0,675	104
	MS_4	3,63	0,850	104
	MS_5	3,70	0,736	104
	MS_6	3,72	0,756	104
	MS_7	3,58	0,878	104
	MS_8	3,64	0,858	104
	MS_9	3,56	0,943	104
	MS_10	3,72	0,782	104
	MS_11	3,69	0,825	104
	MS_12	3,63	0,905	104
	MS_13	3,68	0,804	104
	MS_14	3,61	0,864	104
Goal Setting (GS)	GS_1	2,44	1,164	104
	GS_2	2,49	1,079	104
	GS_3	2,48	1,097	104
	GS_4	2,30	1,078	104
	GS_5	2,38	1,082	104
Self-Evaluation (SE)	SE_1	3,75	0,773	104
	SE_2	3,69	0,738	104
	SE_3	3,67	0,781	104
	SE_4	3,66	0,771	104
	SE_5	3,67	0,794	104
	SE_6	3,67	0,756	104
	SE_7	3,73	0,672	104
	SE_8	3,68	0,804	104
	SE_9	3,70	0,709	104
	SE_10	3,63	0,777	104
	SE_11	3,64	0,799	104
	SE_12	3,48	0,955	104
Seeking Assistance (SA)	SA_1	3,74	0,737	104
	SA_2	3,70	0,722	104
	SA_3	3,65	0,845	104
	SA_4	3,70	0,749	104
	SA_5	3,74	0,737	104
	SA_6	3,67	0,794	104
	SA_7	3,68	0,792	104
	SA_8	3,70	0,749	104
Environmental Structuring (ES)	ES_1	3,38	0,874	104
	ES_2	3,38	0,851	104
	ES_3	3,27	0,862	104
	ES_4	3,23	0,862	104
	ES_5	3,73	0,700	104
Learning Responsibility (LR)	LR_1	3,74	0,763	104
	LR_2	3,75	0,734	104
	LR_3	3,69	0,789	104
	LR_4	3,74	0,750	104
	LR_5	3,78	0,710	104
Organizing (ORG)	ORG_1	2,93	1,160	104
	ORG_2	2,97	1,028	104
	ORG_3	2,69	1,062	104
	ORG_4	3,01	1,029	104
	ORG_5	2,86	1,110	104
	ORG_6	2,85	1,156	104

Table A2

Factorial structure and internal consistency of self-regulated learning components

Variables (Code)	Items	KMO	Bartlett's Test	Communalities	Total Variance Explained (%)	Loadings	Cronbach's Alpha
Memory Strategy	MS_1	0,926	<0,001	0,815	76,884	0,903	0,976
	MS_2			0,690		0,831	
	MS_3			0,853		0,924	
	MS_4			0,776		0,881	
	MS_5			0,711		0,843	
	MS_6			0,630		0,794	
	MS_7			0,698		0,835	
	MS_8			0,772		0,879	
	MS_9			0,650		0,806	
	MS_10			0,830		0,911	
	MS_11			0,894		0,946	
	MS_12			0,760		0,872	
	MS_13			0,868		0,932	
	MS_14			0,815		0,903	
Goal Setting	GS_1	0,869	<0,001	0,686	69,554	0,828	0,890
	GS_2			0,715		0,846	
	GS_3			0,728		0,854	
	GS_4			0,710		0,843	
	GS_5			0,638		0,799	
Self-Evaluation	SE_1	0,897	<0,001	0,771	77,575	0,878	0,971
	SE_2			0,764		0,874	
	SE_3			0,894		0,946	
	SE_4			0,858		0,926	
	SE_5			0,847		0,920	
	SE_6			0,748		0,865	
	SE_7			0,853		0,924	
	SE_8			0,842		0,917	
	SE_9			0,821		0,906	
	SE_10			0,758		0,871	
	SE_11			0,779		0,882	
	SE_12			0,376		0,613	
Seeking Assistance	SA_1	0,850	<0,001	0,838	87,516	0,915	0,979
	SA_2			0,861		0,928	
	SA_3			0,911		0,954	
	SA_4			0,906		0,952	
	SA_5			0,817		0,904	
	SA_6			0,840		0,917	
	SA_7			0,905		0,951	
	SA_8			0,924		0,961	
Environmental Structuring	ES_1	0,808	<0,001	0,808	76,657	0,899	0,924
	ES_2			0,875		0,935	
	ES_3			0,836		0,914	
	ES_4			0,794		0,891	
	ES_5			0,520		0,721	
Learning Responsibility	LR_1	0,889	<0,001	0,858	90,693	0,926	0,974
	LR_2			0,954		0,977	
	LR_3			0,880		0,938	
	LR_4			0,919		0,959	
	LR_5			0,923		0,961	
Organizing	ORG_1	0,860	<0,001	0,691	63,888	0,831	0,886
	ORG_2			0,639		0,799	
	ORG_3			0,545		0,738	
	ORG_4			0,650		0,806	
	ORG_5			0,631		0,794	
	ORG_6			0,678		0,823	

Figure A1

Convergent and Discriminant Validity of the A-SRL-S in the Moroccan Educational Context

