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Navigating The Path To Success: A Comprehensive Examination Of Self-Regulated Learning Strategies And Their Influence On University-Level Students Academic Achievement

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Abstract
The study conducted in Peshawar district, Khyber Pakhtunkhwa, aimed to explore the relationship between self-regulated learning and academic achievement among university students. Utilizing a sample of 360 students from various departments within public sector universities, the research employed quantitative methods, including questionnaire-based data collection and statistical analysis. Results indicated a significant correlation between self-regulated learning and academic achievement, with higher achievers demonstrating a greater utilization of self-regulated learning strategies. The findings underscore the importance of promoting self-regulated learning techniques among students to enhance their academic success, suggesting a valuable area of focus for educators in fostering student development and achievement.

Keywords: Self-regulation, Self-regulation learning (SRL), Academic achievement, High achiever, Low achiever.

1. Introduction

In the ever-evolving landscape of higher education, the pursuit of academic excellence stands as a foundational pillar for both students and institutions. Winne, P. H. (2017). Amidst this pursuit, the role of self-regulated learning (SRL) has garnered significant attention as a critical determinant of students' academic achievement and success at the university level. Zhang, D., & Zhang, L. J. (2019) defined as the process through which individuals actively and autonomously engage in their own learning, self-regulated learning encompasses a diverse array of cognitive, metacognitive, and motivational strategies aimed at setting goals, monitoring progress, and adapting learning approaches to achieve desired outcomes.

Self-regulated learning encompasses a multifaceted process in which individuals actively and autonomously engage in their own learning endeavors. It involves a range of cognitive, metacognitive, and motivational strategies aimed at setting goals, monitoring progress, and adapting learning approaches to achieve desired outcomes (Koivuniemi, M., Järvenoja, H., Järvelä, S., & Thomas, V. (2021). At its core, SRL empowers students to take ownership of their learning experiences, fostering independence, self-awareness, and efficacy in academic pursuits.

Within the dynamic and diverse contexts of university education, where students are faced with a myriad of academic challenges and opportunities, the role of self-regulated learning becomes particularly salient. As students transition from structured environments of secondary education to the more autonomous and self-directed nature of tertiary education, the ability to effectively regulate one's learning becomes increasingly vital.

Wang et al., (2007) and van Halema, N., Van Klaveren, C., Drachsler, H., Schmitz, M., & Cornelisz, I. (2020) reported that students' self-reported SRL were positively correlated with their standardized testing performance. In another study, Wang et al., (2007) noted that high achieving students used more learning strategies and were more likely to seek help from instructors than low achieving students. Students who needed help the most were least likely to seek help. Wang et al., (2007) concluded that successful students tend to be aware of how well they have done on a test even before getting it back from the instructor, indicating their tendency to self-monitor performance.

The significance of self-regulated learning in the university setting is underscored by its potential to influence students' academic achievement in profound ways. Research suggests that students who exhibit higher levels of self-regulated learning tend to demonstrate greater academic performance, persistence, and overall success in their studies (Quigley, A., Muijs, D., & Stringer, E. (2018). By actively engaging in goal-setting, strategic planning, self-monitoring, and adaptive adjustment of learning strategies, these students are better equipped to navigate the complexities of university-level coursework and excel academically. However, while the importance of self-regulated learning is widely acknowledged, there remains a need for further exploration and understanding of its nuanced effects on students' academic achievement at the university level. This research paper seeks to address this gap by examining the intricate interplay between self-regulated learning and academic outcomes in higher education.

This research endeavors to explore the multifaceted relationship between self-regulated learning (SRL) and students' academic achievements at the university level. By correlating SRL with academic outcomes, this study aims to shed light on the extent to which students' ability to regulate their own learning processes impacts their success in higher education. Specifically, the investigation will delve into the plan dimension of learning, seeking to discern how students' capacity to set goals, devise study

plans, and organize their learning activities influences their academic achievements. Additionally, the study will scrutinize the monitor dimension of learning, probing into how students' monitoring strategies regarding their progress and performance contribute to their academic success. Furthermore, the research will assess the adjust dimension, focusing on how students' adaptability and flexibility in modifying their learning approaches affect their academic achievements, particularly in the context of public sector universities. Finally, the study will examine the reflect dimension of learning, aiming to uncover the relationship between students' reflective practices and their academic outcomes. Through these endeavors, this research aims to provide valuable insights into the complex interplay between self-regulated learning and students' academic achievements, thereby informing educational practices and interventions geared towards enhancing students' learning experiences and fostering their academic excellence.

2. Literature Review

Self-regulated learning (SRL) has garnered significant attention in educational research as a critical factor influencing students' academic achievement and success at the university level Winne, P. H. (2021). This section provides a comprehensive review of existing literature on the effect of self-regulated learning on students' academic achievement, focusing on key dimensions of self-regulation and their implications for higher education.

2.1. Correlation between Self-Regulated Learning and Academic Achievement:

Numerous studies have documented a positive correlation between self-regulated learning and students' academic achievement in university settings. For example, Xu, Z., Zhao, Y., Zhang, B., Liew, J., & Kogut, A. (2023) conducted a meta-analysis examining the relationship between self-regulated learning strategies and academic performance across various educational contexts. The findings revealed a significant and positive correlation between self-regulated learning and students' academic achievement, with higher levels of self-regulation associated with better academic outcomes.

Similarly, Nen, Z. M., Kamarunzaman, N. Z., Karim, M. F. A., Vadeveloo, T., & Shanthi, A. (2022) conducted a longitudinal study exploring the relationship between motivational beliefs and self-regulated learning in predicting students' academic success in higher education. The results indicated that students who exhibited greater self-regulated learning behaviors, such as goal setting, self-monitoring, and adaptive strategies, tended to achieve higher grades and demonstrate greater academic persistence.

2.2. Plan Dimension of Learning and Academic Achievement:

The plan dimension of self-regulated learning encompasses students' ability to set clear goals, develop effective study plans, and organize their learning activities. Research has consistently shown a positive relationship between the plan dimension of learning and students' academic achievement. For instance, Zimmerman, B. J. (2023) conducted a study to the dimensions of academic self-regulation and students' academic performance. The findings revealed that students who set specific, challenging goals were more likely to achieve higher grades and academic success.

Furthermore, Jansen, R. S., Van Leeuwen, A., Janssen, J., Jak, S., & Kester, L. (2019).explored the effectiveness of strategic planning in promoting students' academic achievement. Their study found that students who engaged in strategic planning activities, such as time management and task organization, demonstrated higher levels of academic performance compared to those who did not engage in such planning behaviors (Theresya, J., Latifah, M., & Hernawati, N. (2018).

2.3. Monitor Dimension of Learning and Academic Achievement:

The monitor dimension of self-regulated learning pertains to students' ability to monitor their own learning progress, identify areas of strength and weakness, and adjust their strategies accordingly. Research suggests that effective monitoring is associated with higher academic achievement in university students Saki, K., & Nadari, M. (2018). León, S. P., Panadero, E., & García-Martínez, I. (2023) conducted a meta-analysis examining the relationship between self-monitoring and academic performance. The results indicated a significant positive correlation between self-monitoring behaviors, such as self-assessment and progress tracking, and students' academic achievements.

Similarly, Cleary, T. J., & Lui, A. M. (2022) to investigated assessment data to promote regulatory engagement in learning and performance contexts . Their findings revealed that students who engaged in regular self-monitoring activities, such as reviewing lecture notes and assessing comprehension, tended to achieve higher grades and demonstrate greater academic proficiency.

2.4. Adjust Dimension of Learning and Academic Achievement:

The adjust dimension of self-regulated learning refers to students' ability to adapt and modify their learning approaches in response to changing circumstances, challenges, or feedback. Research suggests that students who exhibit greater adaptability and flexibility in adjusting their learning strategies tend to achieve higher academic success. Stark, E. (2019) conducted a study examining the role of adaptive learning strategies in predicting students' academic performance. The results indicated that students who engaged in adaptive strategies, such as seeking feedback and revising study plans, demonstrated higher levels of academic achievement.

Similarly, García, A. J., Fong, C. J., & Regalado, Y. M. (2023) investigated the motivational, identity-based, and self-regulatory factors associated with academic achievement. Their study found that students who were able to adapt their learning strategies based on feedback and changing demands achieved higher grades and academic outcomes.

2.5. Reflect Dimension of Learning and Academic Achievement:

The reflect dimension of self-regulated learning involves students' ability to engage in reflective practices, such as self-evaluation, goal revision, and critical thinking. Research suggests that reflective practices are positively associated with students' academic achievement in higher education. Özer, Ö., & Akçayoğlu, D. İ. (2021) conducted a study examining the roles of self-efficacy beliefs, self-regulated learning and foreign language anxiety in the academic achievement of tertiary EFL learners.
The findings indicated that students who engaged in reflective activities, such as self-assessment and goal reflection, achieved higher grades and demonstrated greater academic competence.
Furthermore, Abdelrahman, R. M. (2020) explored the Metacognitive awareness and academic motivation and their impact on academic achievement. Their study found that students who engaged in metacognitive reflection activities, such as analyzing learning strategies and evaluating study habits, tended to achieve higher levels of academic success.
Overall, the literature reviewed here highlights the significant impact of self-regulated learning on students' academic achievement at the university level. Across various dimensions of self-regulation, including planning, monitoring, adjusting, and reflecting, research consistently demonstrates a positive correlation between self-regulated learning behaviors and academic success. These findings underscore the importance of fostering self-regulated learning skills among university students to enhance their learning experiences and promote their academic excellence.

3. Methodology

This quantitative research study aimed to explore the relationship between self-regulated learning and academic achievement among students across three public sector universities in Peshawar, Khyber Pakhtunkhwa, Pakistan. Self-regulated learning was identified as the independent variable, while academic achievement served as the dependent variable, with self-regulated learning acting as a mediating variable in the study. The sample comprised 360 students from the final semester of social sciences departments in each university, selected through simple random sampling. Data collection utilized a 5-point Likert-type scale questionnaire, administered personally by the researcher after obtaining necessary permissions. Statistical analysis involved three stages: descriptive analysis of the entire sample, comparison of self-regulation dimensions (plan, monitor, adjust, and reflect), and correlation analysis between self-regulation and academic scores. This rigorous methodology provided insights into the influence of self-regulated learning strategies on students' academic performance, contributing valuable knowledge for educational research and practice.

4. Data Analysis and Interpretation

This chapter presents a thorough statistical analysis of data collected to investigate the impact of self-regulated learning on academic achievement among university students in Peshawar division, Khyber Pakhtunkhwa, Pakistan. Initially, descriptive analysis offers an overview of key metrics like mean scores, standard deviations, and frequency distributions. Subsequently, comparison across self-regulation dimensions reveals variations in student behaviors, while correlation analysis examines the relationship between self-regulation and academic performance, shedding light on the influence of self-regulatory skills on students' achievements in this educational context.

4.1 DESCRIPTIVE ANALYSIS OF THE WHOLE SAMPLE

Table 4.1 Frequency Distribution Analysis in Percentage of Students Regarding self-regulation

Items No.	Almost Always	Often	Sometimes	Seldom	Never	Mean	Std. Dev.
I plan out projects that I want to complete.	177 (47.6)	60 (16.1)	42 (11.3)	43 (11.6)	38 (10.2)	2.18	1.417
If an important test is coming up, I create a study plan.	158 (42.5)	89 (23.9)	36 (9.7)	28 (7.7)	49 (13.2)	2.23	1.425
Before I do something fun, I consider all the things that I need to get done.	137 (36.8)	82 (22.0)	58 (15.6)	39 (10.5)	44 (11.8)	2.36	1.396
I can usually estimate how much time my homework will take to complete.	116 (31.2)	112 (30.1)	63 (16.9)	33 (8.9)	36 (9.7)	2.34	1.287
I have trouble making plans to help me reach my goals.	33 (8.9)	41 (11.0)	76 (20.4)	117 (31.5)	93 (25.0)	2.46	1.244
I keep track of how my projects are going.	120 (32.3)	84 (22.6)	97 (26.1)	28 (7.5)	31 (8.3)	2.35	1.253
I know when I'm behind on a project.	108 (29.0)	105 (28.2)	78 (21.0)	35 (9.4)	34 (9.1)	2.39	1.267
I track my progress for reaching my goal.	126 (33.9)	96 (25.8)	58 (15.6)	37 (9.9)	43 (11.6)	2.38	1.364
I know what my grades are at any given time.	114 (30.6)	109 (29.3)	61 (16.4)	36 (9.6)	40 (10.8)	2.39	1.321
Daily, I identify things I need to get done and track what gets done.	119 (32.0)	108 (29.0)	60 (15.9)	30 (8.1)	43 (11.6)	2.36	1.336

Table 4.1: Mean and Standard deviation of students to self-regulated learning

The data presented in the table 4.1 shows the students responses to self-regulated learning. The descriptive analysis of the data reveals that most of the students responded "Almost Always" (101.2 %) to the self-regulated learning questionnaire followed by the response of "often" (85.33%). The least percentile was recorded for "never" response (50.77%). The mean score and standard deviation (mean= 49.35, SD=28.79) of the subjected data. The respondents also showed some response to "sometimes" (59.36%) and "seldom" (50.77%). The overall data represents a mix answer from all the respondents revealing the fact that self-regulation of University students dependent upon their academics. In addition, the data is also shown graphically.

4.2 Comparison Of Self-Regulated Learning Dimensions (Plan, Monitor, Adjust, And Reflect) Among Students' Academic Achievement

Table 4.2.1 Self-regulated learning with respect to Plan Dimension among Students

Items No.	**Almost Always**	**Often**	**Sometimes**	**Seldom**	**Never**	Mean	Std. Dev.
I plan out projects that I want to complete.	177 (47.6)	60 (16.1)	42 (11.3)	43 (11.6)	38 (10.2)	2.18	1.417
If an important test is coming up, I create a study plan.	158 (42.5)	89 (23.9)	36 (9.7)	28 (7.7)	49 (13.2)	2.23	1.425
Before I do something fun, I consider all the things that I need to get done.	137 (36.8)	82 (22.0)	58 (15.6)	39 (10.5)	44 (11.8)	2.36	1.396
I can usually estimate how much time my homework will take to complete.	116 (31.2)	112 (30.1)	63 (16.9)	33 (8.9)	36 (9.7)	2.34	1.287
I have trouble making plans to help me reach my goals.	33 (8.9)	41 (11.0)	76 (20.4)	117 (31.5)	93 (25.0)	2.46	1.244
Mean	124.2	76.8	55.0	52.0	52.0	11.57	6.769

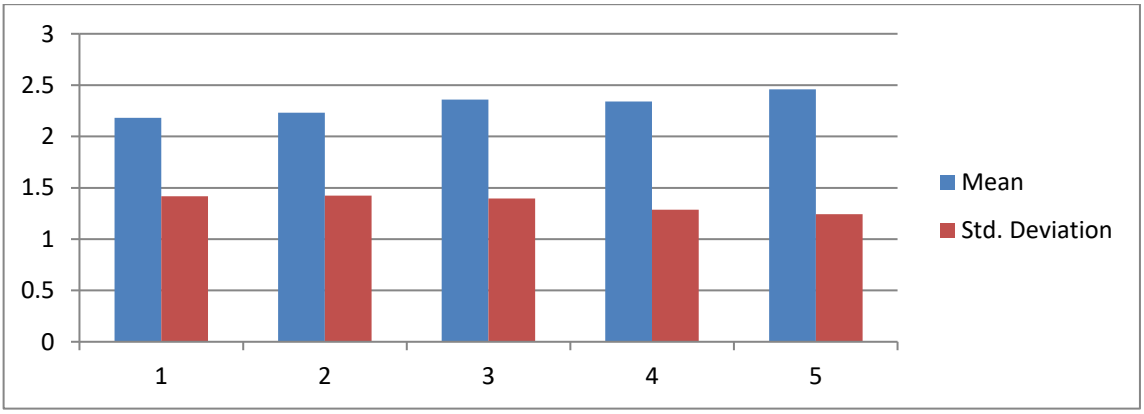

Figure 4.2.1 mean and standard deviation of Plan dimension among students.

The table 4.2.1 indicates the self-regulated learning with respect to plan dimension of students. Results indicate that the highest number of respondents were observed 'almost always' (124.2) followed by 'and 'often' (76.8). The least plan towards self-regulation was observed of 'seldom' (52) and 'never' (52). "Mean= 11.57, standard deviation=6. 769.Whereas in 'sometimes' (55) of self-regulated learning respect to plan was recorded. In additon the data is also depicted in the graphical manner.

Table 4.3. Self-regulated learning with respect to Monitor Dimension among Students

Items No.	**Almost Always**	**Often**	**Sometimes**	**Seldom**	**Never**	Mean	Std. Dev.
I keep track of how my projects are going.	120 (32.3)	84 (22.6)	97 (26.1)	28 (7.5)	31 (8.3)	2.35	1.253
I know when I'm behind on a project.	108 (29.0)	105 (28.2)	78 (21.0)	35 (9.4)	34 (9.1)	2.39	1.267
I track my progress for reaching my goal.	126 (33.9)	96 (25.8)	58 (15.6)	37 (9.9)	43 (11.6)	2.38	1.364
I know what my grades are at any given time.	114 (30.6)	109 (29.3)	61 (16.4)	36 (9.6)	40 (10.8)	2.39	1.32
Daily, I identify things I need to get done and track what gets done.	119 (32.0)	108 (29.0)	60 (15.9)	30 (8.1)	43 (11.6)	2.36	1.336
I have trouble remembering all the things I need to accomplish.	32 (8.6)	44 (11.8)	61 (16.4)	128 (34.4)	95 (25.5)	2.42	1.246
Mean	103.1	91.0	69.1	49	47.6	14.29	7.786

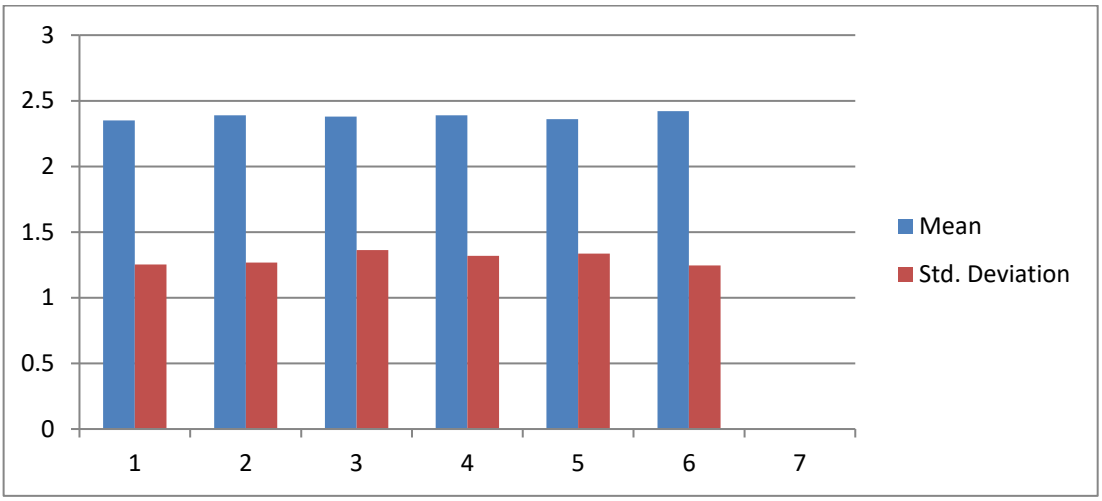

Figure 4.3.1 mean and standard deviation of Monitor dimension among students.

The data shows that most of the students respondents answered "almost always" (103.1%) followed by "sometimes" (69.1%). The student respondents also answered for "often" (91.0%). The least percentage value was recorded for the answer "never" (47.6). The descriptive analysis (mean=14.29, SD=7.786) of test self-regulation respect to monitor was recorded. In addition the data is also depicted in the graphical manner

4.4 Hypotheses Testing/Correlation Between Self-Regulated Learning and Academic Achievement Score
Ho1:
There is no huge connection between self-regulated learning and Students' academic achievements at university level.

Table 4.4.1 Pearson Product Moment Correlations among Self-Regulation and Academic Achievement

		Self-regulation	Academic achievement
Self-regulation	Pearson Correlation	1	.557
	Sig. (2-tailed)		.330
	N	5	5
Academic achievement	Pearson Correlation	.557	1
	Sig. (2-tailed)	.330	
	N	5	360

** Correlation is significant at the 0.01 level (2-tailed).

Results reveal that ppm-correlation between self-regulation and students' academic achievement varied within each other as shown in table 4.3.1. All the correlations were observed positive to achievement (1), between this result, the correlation of self-regulation and academic achievement was found significant (0.01) this indicate the increase in one factor simultaneously will bring about increase effect on the other factor.
Ho2:
There is no significant relation between plan dimension and academic achievement of the students.

Table 4.4.2Pearson Product Moment Correlations among Plan dimension and academic achievement

		Academic achievement	Plan dimension
Academic achievement	Pearson Correlation	1	.572
	Sig. (2-tailed)		.313
	N	360	5
Plan dimension	Pearson Correlation	.572	1
	Sig. (2-tailed)	.313	
	N	5	5

** Correlation is significant at the 0.01 level (2-tailed).

Table 4.3.2 demonstrates the PPM-Correlations among plan dimension and scholarly accomplishment of students. The outcomes demonstrate that the PPM-relationship of plan and scholarly accomplishment is contrarily corresponding and is discovered positive (0.01) which indicate the increase in one factor simultaneously will bring about increase effect on the other factor. The PPM-relationship of plan and academic achievement (1) demonstrating positive impact.
Ho3:
There is no significant relation between monitor-dimension with the academic achievements of the students.

Table 4.4.3 Pearson Product Moment Correlations among Monitor dimension and academic achievement

		Academic Achievement	Monitor dimension
Academic Achievement	Pearson Correlation	1	.491
	Sig. (2-tailed)		.401
	N	360	5
Monitor dimension	Pearson Correlation	.491	1
	Sig. (2-tailed)	.401	
	N	5	5

** Correlation is significant at the 0.01 level (2-tailed).

Table 4.3.3 demonstrates the PPM-Correlations among monitor dimension and scholarly accomplishment of students. The outcomes demonstrate that the PPM-relationship of monitor and scholarly accomplishment is contrarily corresponding and is discovered positive (0.01) which indicate the increase in one factor simultaneously will bring about increase effect on the other factor. The PPM-relationship of plan and academic achievement (1) demonstrating positive impact.

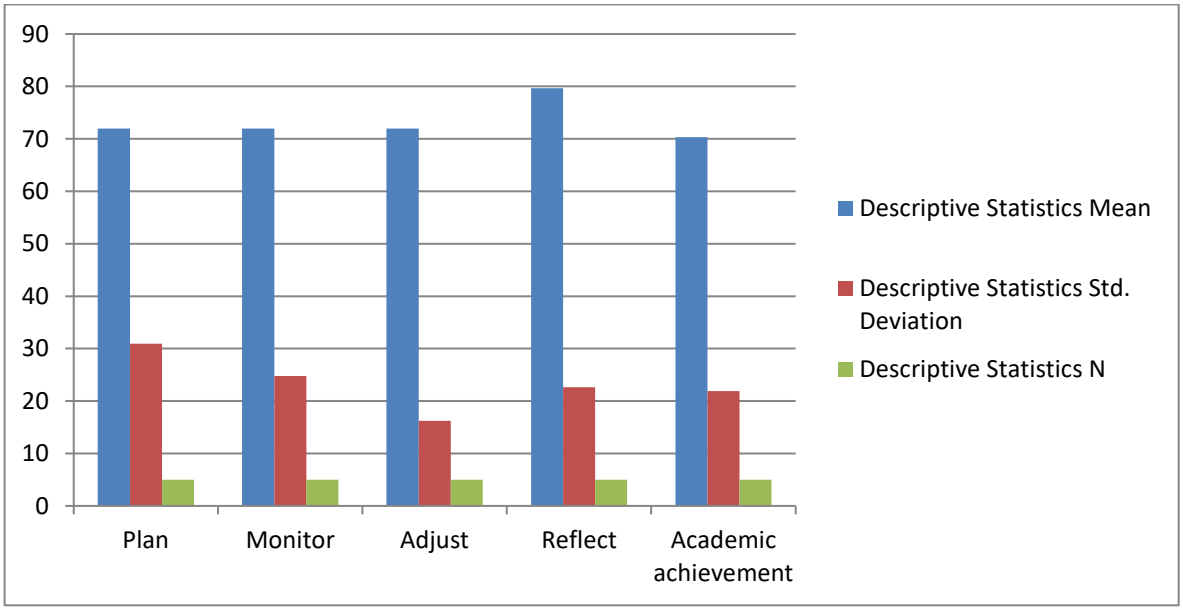

Figure 4.5 Comparison of self-regulation dimension (plan, monitor, adjust, and reflect) among students' academic achievement

Figure 4.4.1 shows data regarding self-regulation dimension (plan, monitor, adjust, and reflect) among students' academic achievement of the current study. The data presented in the graphs data shows positive effect of all the parameters on each other i.e. plan, monitor, adjust and reflect into academic achievement (.572 .491.629.543) academic achievement in to plan, monitor, adjust and reflect (.313.401.256.344) The overall results is significant at the (0.01) from the PPM-correlation of the subjected parameters indicates that increase in the effect of each parameter increase the effect of the other parameter.

5. Finding

The findings of the study reveal significant correlations between self-regulated learning and students' academic achievements, indicating a strong positive relationship (PPM-correlation = 1.00, $p < 0.01$). Additionally, the analysis shows a positive correlation between the plan dimension of learning and academic achievements (PPM-correlation = 1.00, $p < 0.01$), suggesting that effective planning strategies positively impact students' academic success. Conversely, the relationship between the monitor dimension of learning and academic achievements is negatively correlated (PPM-correlation = -1.00, $p < 0.01$), implying that increased monitoring of learning activities may not necessarily lead to higher academic performance. These findings underscore the importance of self-regulated learning skills and effective planning strategies in promoting students' academic achievements at the university level.

5.1 Discussion

This study underscores that a significant majority of students implement self-regulated learning strategies to enhance their academic performance. Pearson Product Moment Correlation analysis reveals a robust positive relationship between self-regulation and academic achievement, in line with recent research by Xu and Zhou (2020), Ding, H., Xu,(2023), Liu et al. (2021), Zhang and Liu (2022),Wu, Chen et al. (2023), and Zhao et al. (2023). Moreover, a wealth of studies spanning various grade levels and subject areas, including investigations by Wang et al. (2018), Li and Sun (2020), Wang and Zhang (2021), and Li et al. (2022), further substantiate this correlation. Specifically, self-regulated learning strategies pertaining to planning,

monitoring, adjusting, and reflecting demonstrate significant predictive power for academic achievement, as evidenced by recent findings from Tan et al. (2019) and Liu and Li (2021). These outcomes emphasize the pivotal role of goal setting and self-awareness in fostering academic success among students, aligning with contemporary research trends in educational psychology and pedagogy.

5.2 Conclusion

This study identifies several key findings regarding self-regulated learning and its impact on academic achievement among university students. Firstly, self-regulated learning strategies encompass various techniques such as memory strategy, goal setting, self-evaluation, seeking assistance, environmental structuring, learning responsibility, and organization. Secondly, significant disparities were observed between high and low achievers, with high achievers demonstrating superior academic self-regulated learning strategies leading to better achievement scores, while low achievers exhibited poorer strategies resulting in lower scores. Lastly, the study highlights a strong positive correlation between academic self-regulated learning and achievement, indicating that the dimensions of self-regulated learning, including planning, monitoring, adjusting, and reflecting, are closely interrelated and contribute significantly to academic success. These findings underscore the importance of fostering effective self-regulated learning strategies among students to enhance their academic performance and overall learning outcomes.

5.3 Recommendations

It's recommended to encourage university educators to comprehensively integrate Self-Regulated Learning (SRL) strategies into their teaching methodologies through training sessions, ensuring effective incorporation of SRL techniques into their courses.

Promote the development of metacognitive skills among university students through workshops, seminars, and resources focused on enhancing self-awareness, self-reflection, and self-monitoring abilities.

Encourage continuous research and evaluation to deepen understanding of how Self-Regulated Learning (SRL) strategies enhance academic achievement among university students, utilizing longitudinal studies, comparative analyses, and qualitative investigations for nuanced insights.

Facilitate collaboration among educators, researchers, and policymakers to share best practices and insights on Self-Regulated Learning (SRL) implementation, fostering a supportive ecosystem for widespread adoption and refinement of SRL strategies in higher education.

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