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The Case for Cognitive and Non-Cognitive Learning Strategies: Perspective of Marginalized Pakistani University Students

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ARTICLE DETAILS	ABSTRACT
<p>History:</p> <p>Received: June 14, 2023 Accepted: December 22, 2023</p>	<p>The study explored the differences in preferred learning strategies according to students' academic achievement, age, area, and gender among the university students of various departments of the University of Loralai, Balochistan. A survey research method was used to conduct this study. Descriptive and inferential statistics were used to determine the differences in the learning strategies as per academic achievement, area, age, and gender of an aforesaid sample. A convenient sample (N = 396) of students (M= 237, F= 159) from various departments of the University of Loralai, Balochistan was taken. For data collection, a reliable measure of 17 items (3 factors) was used. The construct validity of the measure, which was obtained by EFA & CFA, was considered from the prior research led in Spain and KSA. Results revealed that all learning strategies were used but among these, the ESS (emotional social support) learning strategy was the most favored one while the MLS (microlearning strategy) was the least favored one. Males and females were found to have significant differences in using the overall learning strategies. Age groups were also found to have significant differences in using the KMMC strategy, ESS strategy, and overall LS. Limitations and recommendations were enlisted for future studies.</p> <p>© 2023 The Authors, Published by WUM. This is an Open Access Article under the Creative Common Attribution Non Commercial 4.0</p>
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1. Introduction

The study (Amin et al., 2020) found that peace education is a tool that aware prospective teachers of global awareness. Peace education can also be linked to environmental awareness. The researchers (Akramet al., 2020) also stated that students face problems when they come into a new environment. The findings reported that these might be due to environmental changes. Any person can face problems when he/ she enters into a new environment. Learning is an

activity that can develop a person's interest in the study through the unique strategy used for it. Learning strategies are the steps, which are taken by learners for the ease of their lesson learning and to make learning faster and more enjoyable (Almoslamani, 2022; Muelas & Navarro, 2015). The learning strategies are the process of taking notes, organizing the material, underlining the important points, and then summarizing it to remember the lesson. Rote learning is a kind of lesson learning by heart. Further, rote learning is a traditional approach to learning that has been active in the past in various countries like Saudi Arabia (Almoslamani, 2022), Spain (Muelas & Navarro, 2015), Pakistan, and other countries as well. The researchers agreed on the point that rote learning makes the students passive rather than active recipients (Almoslamani, 2022; Al-Seghayer, 2021; Kim & Alghamdi, 2019). Pakistani education system acts upon rote learning in their classrooms; however, learners prefer other learning strategies (Almoslamani, 2022) rather than rote learning. It means diverse strategies will replace traditional rote learning (Almoslamani, 2022; Al-Seghayer, 2021).

Good performance and high exam scores are predictors of academic achievement (Almoslamani, 2022; Vermunt & Donche, 2017). Contrarily, high academic achievement is due to the preferred learning strategies; therefore, preferred learning strategies from learners' perspective must be examined to check, which learning strategy the learners in Pakistan may prefer and may not prefer. Therefore, it is vital to identify the diverse learning strategies with reference to students enrolled at various departments of a marginalized Pakistani University i.e., the University of Loralai, Balochistan. Furthermore, these learning strategies are then compared based on age, area, and gender.

Once the learning strategies are identified, the students will then definitely be able to select the correct learning strategy to learn their lessons properly for the achievement of good grades. Thus, the objective of this paper was to provide a complete profile of the learning strategies and consequently, their comparison on the basis of academic achievement, age, area, and gender. The aim of the research is outlined in the following objectives:

- i. To examine the overall learning strategies and their use among the students of the University of Loralai
- ii. To identify the most preferred learning strategy and its use among the students of the University of the Loralai
- iii. To identify the least preferred learning strategy and its use among the students of the University of the Loralai
- iv. To determine the differences in preferred learning strategies as per academic achievement (GPA), age, area, and gender among the students of the University of Loralai

2. Literature Review-Development of Learning Strategies Model

Various studies have been conducted in numerous contexts on the learning strategies used. Further, research regarding learning strategies has many gaps in either way somewhere the context was Europe (Jiménez et al. 2018) or Gulf countries (Almoslamani, 2022) or somewhere it was explored in the field of English language specifically (Al-Seghayer, 2021). However, when it comes to the Pakistani context, we have no rich literature on learning strategies therefore, we considered that if we could investigate learning strategies in the Pakistani context it would enrich the literature as well as give the theoretical foundation for future Pakistani researchers. In this case, the focus of the study is to explore the Pakistani context and to show the readers, which kind of learning strategy is most preferred and least preferred by Pakistani University students when they are involved in their lecture learning.

2.1. Learning Strategies Preference

The literature strongly recommended that the background, culture, and personal preferences of the learners are the main factors that shape the beliefs about using learning strategies. For instance, some of the researchers (Chiu et al., 2007) are of the view that social and financial background can also have particular effects on the learning strategies used. Thus, socio-cultural factors are important to consider regarding learning strategies use. Existing literature possesses a number of examples of researchers who worked on learning strategies to use, for example, Vega-Hernández et al, (2017) conducted a study on Spanish university students by exploring the three learning strategies (i.e., cognitive and learning control, learning support and study habits). Cognitive and learning control strategy was most preferred while study habits were the least preferred. Regarding the cognitive strategy, the same results were given by Alarcón Díaz et al, (2019) who conducted a study in Peru among university students. They found that the students were mostly using cognitive strategies (meta-cognitive strategies, processing of the information strategies and control of the context strategies). It meant that cognitive strategy is important to choose for learning.

Some of the researchers were specifically subject oriented and sought the learning strategy in English and specific contexts only such as Gulf countries. For example, several researchers have closely explored the learning strategies of Saudi EFL learners. Al-Otaibi (2004) examined the language-learning strategies of Saudi EFL learners and found that cognitive strategies (memory and cognitive strategies) were mostly favored while the social, affective, and compensation learning strategies were least favored. In addition, Al-Refay and Koura (2010) in Saudi EFL learners ranked cognitive strategy the most while affective learning strategies as the least preferred. Past studies in Middle Eastern countries have shown that cognitive/meta-cognitive strategies had shown as their best choice among the students and were liked by the students the most (Alhaisoni, 2012; Mansoor et al, 2013; Aljuaid, 2015). Prior to this, the same author i.e., Aljuaid (2010) revealed that meta-cognitive strategies were the most preferred and memory strategies the least in Saudi EFL learners. Consistent with these studies, Alkahtani (2016) revealed that meta-cognitive strategies were the most dominant strategy while memory and affective strategies were the least dominating Saudi EFL learners. Alhaysony (2017) also reached the same conclusion about the cognitive learning strategy use, because the Saudi EFL learners used cognitive strategies (meta-cognitive and compensation strategies) most frequently, while memory and affective strategies were used least often. To sum up the aforementioned findings, learners prefer to use cognitive and meta-cognitive strategies. They use affective and memory strategies the least. Generally, learners prefer two (i.e., cognitive and meta-cognitive strategies) out of the six strategies and the other four strategies the least, particularly the affective and memory strategies (Al-Seghayer, 2021).

Based on the literature review, it is clearly shown that most of the studies were conducted in Gulf countries, Spain and Peru. No relevant study was found that has shown the picture of context therefore it is crucial to conduct this study in Pakistan as it will fill the research gap and will provide the theoretical foundation for future Pakistani researchers.

2.2. Learning Strategies and Demographic Variables (Academic achievement, age, gender, and area)

Academic performance is predicted by the strategies; therefore, the literature has also shown such kinds of studies to make the association between both variables. These studies have been conducted in various contexts like distance learning and non-distant learning. Academic achievement among school students has been determined through their final exam scores, grades,

and test scores in a subject that they took. Learning strategies are proven to play a vital role in academic achievement because upon learning strategies students' performance is generally based (Neroni et al., 2019). In the present research, the difference in preferred learning strategies as per academic achievement and other demographic variables (age, gender, and area) was assessed among university students. Academic achievement was determined through overall GPA instead of a specific subject as explored in previous literature. Learning strategies are proven to be a significant predictor of academic achievement as well as a significant gender-wise difference has also been detected for the use of learning strategies, in favor of females (Almoslamani, 2022).

Another research conducted by Nabizadeh (2019) identified a strong linear relationship between the use of learning strategies and CGPA (as academic performance) among medical students. In this research, gender and age showed us the research gap. One more research was conducted in Nigeria by Christian (2014), it was subject-specific (chemistry). In this research, learning strategies, age, gender, and area of the school (location) were linked with academic achievement. Learning strategies played a main role in predicting achievement in the subject of chemistry; the cooperative learning strategy was the most used strategy among chemistry students. Gender, age, and area or location of the school were closely related to the academic achievement of aforesaid students.

An Indonesian researcher Ahsanah (2020), focused on the gender and age perspective for using learning strategies to learn the English language among high school students of both junior and senior sections. It was found that age is more closely linked with the use of learning strategies than gender because there was no significant gender difference in using learning strategies for learning the English language. Whereas younger high school students (junior section) were using language learning strategies more as compared to older ones (senior section). Research was scarce regarding learning strategies and academic achievement in higher education institutes. Moreover, a few researches have been found in which demographic variables e.g. age gender, area or location of the institute, and educational year, have been explored in relation to learning strategies and academic achievement. Mixed findings have been reported in that research about demographic variables like age, gender, area, and educational year. Furthermore, learning strategies have been explored in specific contexts and domains like language learning and specific subject learning. This is one of the main reasons to conduct the current research in the Pakistani context specifically among the higher institution students of a marginalized area, how they generally learn their lectures by using various learning strategies, and how it affects their academic performance.

3. Theoretical Framework-Walberg's theory of educational productivity

Educational productivity purely belongs to academic success and achievement. A theory of educational productivity was introduced by Walberg (1981), this theory was based on the antecedents of academic outcomes that were considered to be psychological characteristics of students as well as their environment. Reynolds and Walberg (1992) revealed that the psychological characteristics of the students at attitudinal, cognitive, and behavioral levels are the major contributors to educational success. Moreover, Walberg, Fraser, and Welch (1986) introduced nine major components that contribute to students' academic performance. These nine components were paired up into three broad categories: Students' characteristics, given instructions, and environment. Students' characteristics include the first three components; their ability, level of motivation and age. The next two components consist of the instructions given to the students by the teachers, which include the quantity and quality of instructions. The third category is comprised of the last four components depending on the educational environment and

the student’s social circle; students’ peer group, exposure to media, home environment, and classroom atmosphere, further specified by DiPerna et al. (2002). Therefore, it can be predicted that the mode of instruction and use of learning strategies play a vital role in student’s academic success and performance. Every student uses a different learning strategy according to their personality and interests which determines their academic achievement. As per the present research, all the aforementioned factors determined the rate of academic success and achievement. Thus, this theory of educational development by Walberg provides a strong theoretical ground for the current research.

4. Methodology of the Study

The methodology of the present study has been explained below in detail.

4.1. Research Design

We used the survey descriptive quantitative method of research to carry on with this study. Further, descriptive (Mean and frequency) and inferential statistics (t-test and one-way ANOVA) were used because this study aimed to determine the differences in preferred learning strategies as per academic achievement, age, and gender among University students. The study used the Brief ACRA-C learning strategy scale as the data collection tool. Its validity and reliability process has been explained in the later portion of this paper.

4.2. Sample, Sampling Technique, and Parametric Assumptions

The sample of the study was all the university students who were enrolled in various departments of the University of Loralai. We distributed the questionnaires through a convenience sampling technique to the students, with the help of concerned teachers of the respective departments. Questionnaires were filled out by 396 participants ($M = 237, F = 159$). The complete profile of the participants is shown in Table 1 below. The researchers did not apply the test of normality because according to CLT (central limit theorem) if the sample size is greater than 100 then one can ignore the test of normality due to the exceeding limit of the sample size (Altman & Bland, 1995; Ghasemi & Zahediasl, 2012). In the current research, it was assumed that data is nearly normal; therefore, parametric assumptions for the analysis of the data were chosen. So, the mean as a measure of central tendency was selected to compare the means for analysis purposes. Further, for multiple comparisons, the one-way ANOVA was used to meet the objectives.

Table 1: Complete Profile of the Participants (N = 396)

Demographic Variables			<i>f</i>
Gender	Male		237
	Female		159
Age (in years)	18-22		181
	22-26		110
	26-30		40
	Above 30		65
Marital Status	Married		104
	Unmarried		292
GPA	2.0 to 2.5	Passing	84
	2.6 to 3.0	Average	137
	3.1 to 3.5	Good	72
	3.6 and Above	Excellent	90
Departments	Business, Management & Computer Sciences		68

Mathematics	26
Zoology	27
Political Science	28
Education	247
Total	396

The demographic profile of the participants demonstrated that a majority of the sample was male, belonged to the 18-22 years of age group, was unmarried, and had a GPA within the range of 2.6-3.0. The major proportion of the sample belonged to the education department.

4.3. Reliability of the Scale

The current researchers adopted the short version of the ACRA-C learning strategies scale of Jiménez et al. (2018) which is widely used among researchers for higher education in Universities. The measure was loaded on three factors such that the *micro strategies* and *keys for memory and meta-cognition strategies* each had five items while the *emotional-social support strategies* had seven items thus the total scale had 17 items. The scale was constructed on a four-point Likert scale having a score of 4 for Always use, 3 for often use, 2 for rarely use, and 1 for never use. The reliability of the total scale and dimension wise is shown in the following Table 2.

Table 2: Reliability of the ACRA-C learning strategies Scale- Dimension wise and Total

Dimensions	Items	α
Micro strategies	5	0.83
Keys of Memory and Metacognition	5	0.65
Emotional-Social Support	7	0.61
Total	17	0.84

The reliability of the scale was determined through Cronbach's Alpha reliability coefficient. The reliability of each dimension and total reliability of the scale was from 0.61 to 0.83, which is acceptable among the researchers. Further, the total reliability score of the scale was 0.84, which shows high consistency among the variables (Almoslamani, 2022).

4.4. Validity of the Scale-Reliance on Jiménez's et al., (2018) Construct Validity

The said scale is the standardized scale and is widely used (Bahamón, et al., 2012) by the researchers for the learning strategies. Past researchers (Bahamón, et al., 2012; Jiménez et al., 2018; Almoslamani, 2022) used the PCA and CFA to validate the measure. To make it more clear, Jiménez et al. (2018) and Almoslamani (2022) recently established the construct validity of the said instrument through factor analysis (EFA & CFA) technique. Besides the above-mentioned researchers, various other researchers (e.g., Reyes et al., 2021) have also established the validity of this scale in various countries; therefore, the prior validation was considered enough for the current research by us (the current authors). Jiménez et al. (2018) validated the said scale. For the extraction of factors, Jiménez et al. (2018) opted for the four factors solution for which the saturation value (<0.450) was kept. The fixed number of factors to be retained was four. When the items did not saturate in any of the factors (< 0.450) then a final version of the scale with the 17 items was reached which was used in the current study.

4.5. Data Analysis

For the data analysis process, we divided the range of scores in a meaningful statistical way shown in Table 3 below supported by previous studies (Almoslamani, 2022; Al-Nouh et al.,

2014) as the reference point.

Table 3: Scale of Ranges of Mean Scores and Level of Frequency Use

Ranges of Mean Scores	Level of Frequency Use
1.00 - 6.00	Never use
6.00 - 12.00	Rarely use
12.00 - 18.00	Often use
18.00 & Above	Always use

Table 3 represents the ranges of mean scores that are divided into four levels. The level of frequency use is also shown in this table, which will represent the use of each learning strategy, by determining the range under which it falls.

5. Results and Discussion

To meet the first objective of the study, the overall mean score of the three learning strategies (e.g., microlearning, keys for memory and meta-cognition, and emotional-social support learning strategies) and the frequency of their use were examined as shown in Table 4 below.

Table 4: Overall Mean Score and Their Level of Frequency Use

Dimension	<i>M</i>	<i>SD</i>	Level
Micro Learning Strategies	13.96	2.62	Often Use
Keys of Memory and Meta-cognition	17.89	2.19	Often Use
Emotional-Social Support	24.89	3.38	Always Use
Overall mean score of the three learning strategies	56.74	5.34	Always Use

The overall mean score of the three learning strategies is 56.74, which falls under the category of “Always Use”. It means that in entirety all the students at various departments of the University of Loralai mostly preferred overall strategies. It is a good way to use all three learning strategies for learning of lecture because the respondents might have thought that it depends on the nature of the lecture that they want to learn. Although this result is not supported by the past literature but still it is unique because various departments of the University of Loralai can take this research as a guideline to plan their lessons because they will know what strategies are preferred for academic achievement in Pakistani universities. Contrary to the current study results, the recent study of Almoslamani (2022) revealed that the three learning strategies were only “often used” in the Saudi Arabian context. It is possible that this might be a contextual problem but it can be further explored by the researchers as to why these differences among the research studies are occurring.

To meet the second objective of the study, the mean score of the respondents was calculated based on which rank and use of frequency was assigned. The mean value, rank, and frequency are given in Table 5 below.

Table 5: Mean Score, Rank, and Frequency of Use of Emotional-Social Support Learning Strategy

Dimension	<i>M</i>	Rank	Frequency of Use
Emotional-social support	24.89	1	Always use

Table 5 shows that participants preferred the emotional-social support learning strategy the most compared to the remaining two learning strategies (Micro strategies and keys for memory and

meta-cognition). It shows that the participants always used the emotional-social support learning strategy for the learning of their lecture. It can be interpreted that students at various departments of the University of Loralai use the emotional-social support learning strategy because they might consider themselves more sociable. It seems that they always talk to classmates about the lesson and discuss it with each other. Further, they might discuss their lesson with their teachers if they feel any problem. Since the emotional-social support learning strategy is completely favored by all the participants, therefore, they also feel proud to help others in the learning.

Our study result is not supported by some of the previous studies because some of the past studies revealed that students had to rely on micro-learning strategies (Almoslamani, 2022; Alhaisoni, 2012; Al-Otaibi, 2004) and/or cognitive and meta-cognitive strategies (Al-Otaibi, 2004; Al-Refay & Koura, 2010; Alhaisoni, 2012; Aljuaid, 2010, Aljuaid, 2015; Alkahtani, 2016; Alhaysony, 2017; Vega-Hernández et al. 2017) while ours was different and were mostly relied on emotional-social support strategy. However, it can be interpreted that the Pakistani culture has the characteristics of collectivism therefore; students mostly use the emotional-social support learning strategy because the students feel proud when they share the learning with each other.

To meet the third objective of the study, the mean score of the respondents was calculated based on which rank and use of frequency was assigned. The mean value, rank, and frequency of learning strategy use were calculated, as shown in Table 6 below.

Table 6: Mean Score, Rank, and Frequency of Use of Micro Learning Strategy

Dimension	<i>M</i>	Rank	Frequency of Use
Micro learning strategies	13.96	3	Often use

As discussed before that our study shows the micro strategy is the least preferred by the students in various departments of the University of Loralai, as represented by the above table 6. It means that the participants least preferred the micro learning strategy. It can be said that the participants do not underline the main points and do not make summaries of the topics at the end of their learning. Our study is incongruent with the past studies' results which are explained already in the prior portion.

To meet the fourth objective of the study regarding students' academic achievement, a measure of inferential statistics, one-way ANOVA was used to conduct multiple comparisons according to students' academic achievement through their overall GPA across preferred learning strategies. This objective aimed to determine the differences in preferred learning strategies as per academic achievement (GPA) among the students of the University of Loralai. Mean difference values and Post hoc analysis values that determine the existing difference in each group are reported in Table 7 below.

Table 7: The Difference in Students' Learning Strategies According to Their GPA (N = 396)

Scales	Poor GPA (n = 84)		Average GPA (n = 137)		Good GPA (n = 72)		Excellent GPA (n = 90)		F	P	Post hoc i>j	D (i-j)	95% CI	
	M	SD	M	SD	M	SD	M	SD					LL	UL
LSS	58.19	5.44	56.16	5.05	54.01	4.81	58.66	5.23	13.76	.00	1>3	4.18	1.99	6.36
											1<4	-.47	-2.54	1.59
											2>3	2.15	.16	4.13
											2<4	-2.50	-4.35	-.65
MLS	14.50	2.90	13.75	2.17	12.72	2.56	14.82	2.62	10.78	.00	1>3	1.78	.70	2.85
											1<4	-.32	-1.33	.69
											2>3	1.04	.06	2.01
											2<4	-1.06	-1.97	-.15
KMMC	18.23	2.05	17.72	2.24	17.29	2.31	18.20	2.01	3.42	.01	1>3	.94	.03	1.87
											1>4	.04	-.83	.91
											2>3	.43	-.40	1.26
											2<4	-.48	-1.26	.30
ESS	25.45	3.31	24.67	3.58	24.00	3.54	25.64	2.73	4.18	.00	1>3	1.45	.03	2.87
											1<4	-.19	-1.5	1.1
											2>3	.68	-.61	1.96

2<4	-.96	-2.15	.23
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3<4	-1.64	-3.04	-.25
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*Note.*LSS = Learning Strategies Scale; MLS = Micro Learning Strategy; KMMC = Keys of Memory and Metacognition; ESS = Emotional Social Support

From Table 7, it is clear that significant differences in students' academic achievement are present in all of the preferred learning strategies. Students' GPA measures students' academic achievement in the present research. Post-hoc analysis reveals that this difference exists between participants who achieved Poor, Average, and Good GPAs. The students who achieved excellent GPAs preferred all the learning strategies rather than a certain strategy as compared to the rest of the three groups having poor, Average, and Good GPAs. Similarly, significant differences are found in micro learning strategies among student's academic achievement. Students with poor and average GPAs mostly use micro learning strategies than students with Good GPAs. Students with excellent GPAs preferred micro learning strategies more than the former three groups of students with poor, average, and Good GPAs.

This result shows that Keys of Memory and meta-cognition strategies are significantly different among students' GPAs. Students with excellent GPAs prefer this learning strategy the most as compared to the rest of the three groups. While students with poor GPAs, also use this learning strategy more than the average and good GPA obtaining students. As far as emotional social support is concerned, students with average and good GPAs they less prefer emotional and social support strategies as compared to poor and excellent GPA obtaining students. Students with excellent GPAs prefer emotional and social support learning strategies in addition to the other two strategies which are MLS and KMMC. As is already depicted in the above table, students with excellent GPAs prefer all the learning strategies rather than any specific strategy. There is a possibility that high achievers use multiple learning strategies by merging them into each other while learning their lectures instead of focusing on a single strategy.

Table 8: Gender Wise Contrast for Study Variables (N=396)

Variables	Male(n=237)		Female (n=159)		<i>t</i>	<i>p</i>	95% CI	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>			<i>LL</i>	<i>UL</i>
Overall LS	57.17	5.22	56.10	5.46	1.95	.05	-.01	2.13
MLS	14.12	2.66	13.71	2.52	1.51	.13	-.12	.93
KMMC	17.99	2.17	17.74	2.20	1.12	.25	-.18	.69
ESS	25.05	3.32	24.64	3.46	1.17	.24	-.27	1.08

Note. Overall LS = Learning Strategies; MLS = Micro Learning Strategy; KMMC = Keys of Memory and Metacognition; ESS = Emotional Social Support. *p* < .05

Table 8 shows that male and female participants possess significant differences in using overall learning strategies. Table 8 also depicts that males prefer each strategy more than females.

Table 9: The Contrast of Age (In Years) Related Differences for Study Variables (N=396).

Variable s	Below 18 (n=07)	18-22 (n=174)	22-26(n=110)	26-30(n=40)	Above 30(n=65)	<i>F</i>	<i>p</i>	<i>i-j</i>	D (i-j)	95% CI	
	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>	<i>M (SD)</i>					<i>LL</i>	<i>UL</i>
Overall LS	59.28 (3.77)	58.12(5.22)	55.97 (5.33)	55.30(4.29)	54.96(5.45)	6.79	.00	2>3	2.1	.42	3.83
								2>4	2.8	.33	5.32
								2>5	3.1	1.09	5.22
MLS	14.85 (3.43)	14.32(2.80)	13.77 (2.41)	13.65(2.10)	13.38 (2.51)	2.16	.07				

KMMC	19.14 (.69)	18.37 (1.86)	17.57 (2.27)	17.67 (2.22)	17.15(2.61)	5.42	.00	2>3	.80	.08	1.51
								2>5	1.21	.36	2.07
ESS	25.28 (2.13)	25.42 (3.03)	24.62 (3.82)	23.97(2.93)	24.43 (3.70)	2.33	.05				

Note. OverallLS = Learning Strategies; MLS = Micro Learning Strategy; KMMC = Keys of Memory and Metacognition; ESS = Emotional Social Support. * $p < .05$, ** $p < .01$

Table 9 shows the existence of significant differences among all age groups in the KMMC strategy, ESS strategy, and overall LS. Further post hoc analysis depicted that the second age group of participants (18-22 years) used all the learning strategies more than the third (22-26 years), fourth (26-30 years), and fifth (Above 30 years) age group of participants while learning their lecture. Similarly, participants with 18-22 years of age use keys of memory and Meta-cognition more than the participants with 22-26 and above 30 years of age, while memorizing their lecture.

6. Conclusion and Recommendations of the Study

The study assessed the university students' use of learning strategies when they encountered the learning of their lesson as well as the difference in preferred learning strategies as per their academic achievement. The study found that the emotional-social support learning strategy was most preferred while the micro-learning strategy was least preferred. It revealed that students with excellent GPAs (high academic achievers) prefer all the learning strategies while learning their lectures rather than a single strategy. A gender-wise difference was also found. Male students prefer all the learning strategies as compared to female students. Significant differences among all age groups of participants across keys of memory and Meta cognitions, emotional and social support, and overall all the learning strategies were detected. According to the reported results of the current study, classroom teaching should be aligned with the most preferred learning strategy as well as all the learning strategies can be utilized together for better academic performance.

7. Limitations of the Study

This is only a small-level descriptive study that took place in various departments of the University of Loralai, Balochistan, Pakistan. Results of this study reflect the perception of only one entity i.e., students of the University of Loralai, which might be a limitation for the generalization about the broader population. Although the study is conducted at a small level, still it can give important inferences about the learning strategies. The other limitation is scale validation. The current researchers did not run the validation processes themselves but depended on the prior validation process of previous researchers, mentioned in the methodology part. Future researchers can work on these limitations and can do a much broader study on the same construct on different samples to make the generalization process possible.

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