أساليب التعلم المفضلة لدى طلبة جامعة ظفار في سلطنة عمان

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الملخص:

هدفت الدراسة الحالية إلى التعرف على أساليب التعلم المفضلة لدى طلاب الجامعة. تم جمع البيانات من ٥٥٤ طالباً وطالبة في جامعة ظفار (٣٠٣ طالبة، ٢٥١ طالباً) موزعين على ثلاث كليات مختلفة، هي كلية الآداب والعلوم التطبيقية، كلية التجارة وإدارة الأعمال، كلية الهندسة. استخدم الباحثون مقياس فيلدر وسولومان لأساليب التعلم لقياس أسلوب التعلم المفضل لدى المشاركين. أكدت نتائج الدراسة على أهمية فهم تفضيلات التعلم الفردية وتأثيرها على تجربة التعلم الشاملة. كما كشفت النتائج أن الطلاب في سلطنة عمان أظهروا تفضيلات متنوعة لأنماط التعلم المختلفة، بما في ذلك "النشط" أو "الانعكاسي"، و"الحسي" أو "الحدسي"، و"البصري" أو "اللفظي"، و"المتسلسل" أو "الشامل". تلعب هذه التفضيلات دورًا مهمًا في تشكيل كيفية معالجة الطلاب للمعلومات، والمشاركة في أنشطة التعلم، وتحقيق النجاح الأكاديمي في نهاية المطاف.

الكلمات المفتاحية: أساليب التعلم، مقياس فيلدر وسولومان، جامعة ظفار، سلطنة عمان.

The preferred learning Styles of Dhofar University students in the Sultanate of Oman

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Abstract

The current study aimed to investigated the preferred learning styles of University students. The data were collected from 554 students at Dhofar University. The students were enrolled on different programs of study across three Colleges. Namely, these colleges are the College of Arts and Applied Sciences (CAAS), the College of Commerce and Business Administration (CCBA) and the College of Engineering (CE). Our sample consisted of 303 female students and 251 male students. The researchers used Felder and Soloman index of learning styles to measure the participants' preferred style of learning. The findings of this study shed light on the importance of understanding individual learning preferences and their influence on the overall learning experience. The results of the study revealed that students in Oman demonstrated varied preferences for different learning styles, including 'active' or 'reflective', 'sensing' or 'intuitive', 'visual' or 'verbal', and 'sequential' or 'global' learning. These preferences play a significant role in shaping how students process information, engage in learning activities, and ultimately achieve academic success.

Key Words: learning Styles, Felder and Soloman index, Dhofar University, Oman

Background

Students have different ways of understanding and keeping information, which can affect their academic success. These differences in learning might be related to students' preferred learning styles. However, there is debate about how learning styles impact academic achievement. Some educators believe that using methods that match students' learning styles can help them learn better. Research on the effects of learning styles on academic achievement has had mixed results

Jayanama (2018) described learning style as a person's preferred way of acquiring, organizing, and retaining information. * Their learning style greatly influences how they interact and respond in learning situations. Islam and Mahavidyalaya (2019) defined learning style as how students use their senses to absorb new knowledge. They acknowledged the ongoing debate on the impact of learning style on students' comprehension. Academic achievement refers to the grades a student earns in their coursework. It encompasses the outcomes of a learner's educational journey, reflecting the advancements they have gained in their understanding and capabilities. Learning involves an ongoing cycle of acquiring knowledge, reviewing it, and developing confidence in its application. The VARK model suggests that individuals have different learning styles (visual, auditory, reading/writing, kinesthetic). To achieve optimal learning outcomes, it is beneficial to combine various learning approaches. Additionally, learners can develop a comprehensive understanding through different pathways, such as by connecting ideas, completing tasks, or reflecting on experiences. Richard Felder and Linda Silverman introduced a different learning styles model in 1988, particularly geared towards engineering students. Subsequently, in 1991, they developed the Felder-Soloman's Index of Learning Styles, a tool for assessing these specific learning preferences
(source: Zywno, 2003).

The Felder model of learning styles focuses on aspects of learning styles significant in engineering education, this model has five dimensions: Processing (Active/Reflective), Perception(Sensing/Intuitive), Input (Visual/Verbal), Understanding (Sequential/Global) and Organization (Inductive/Deductive), then the fifth dimension has been removed. The Felder model of learning styles focuses on aspects of learning styles significant in engineering education, this model has five dimensions: Processing (Active/Reflective), Perception(Sensing/Intuitive), Input (Visual/Verbal), Understanding (Sequential/Global) and Organization (Inductive/Deductive), then the fifth dimension has been removed. The Index of Learning Styles (ILS) is a 44-question assessment tool that measures preferences along four dimensions of the Felder-Silverman Learning Styles Model: Active/Reflective, Sensing/Intuitive, Visual/Verbal, and Sequential/Global. Each dimension has 11 forced-choice questions, where each option (a or b) corresponds to a category within that dimension. Respondents indicate their preferences on a scale of 0 to 11, with higher scores indicating stronger preferences. For example, a score of 0 or 1 indicates a strong preference for reflective learning, while a score of 10 or 11

indicates a strong preference for active learning. While students may indicate a preference for learning through sensing (practical experiences) or intuition
(abstract ideas), such preferences do not accurately predict their strengths or weaknesses in either approach. Classifying students as sensors or intuitors does not guarantee that they possess the abilities associated with their preferred style. Instead, the strength of their preference correlates with the likelihood of having strengths in that area, but not necessarily weaknesses in the opposite approach. (Felder and Spurlin (2005).

The way students learn is influenced by their learning preferences. Active learners prefer hands-on experiences over passive reading. They thrive in discussions, where they can share their understanding by giving examples and explaining concepts to others. These learners enjoy collaborating in group settings rather than working independently. Active learners find traditional classroom settings dull due to their preference for movement and hands-on experiences. They struggle to stay engaged while sitting passively and taking notes. In contrast, reflective learners prefer to absorb information rather than act upon it. They need time to process ideas and consider their implications before engaging actively. Reflective learners often prefer solitary work before participating in group activities.

People who learn sequentially solve problems methodically, one step at a time. In contrast, global learners quickly grasp overall concepts and solve problems creatively, even if they can't always explain their thought process. Visual learners excel at remembering images like charts and videos, while verbal learners prefer written or spoken explanations. Combining visual and verbal information boosts learning for all.

Although experts disagree about learning styles, how students learn and what they prefer can greatly affect the best learning activities and work in college classes. These choices depend on the specific knowledge and skills needed. "Learning preferences" is generally considered a broader term than learning styles, as it includes a wider range of traits that might affect learning. These traits can include factors such as the learning environment, the situation, and the atmosphere, such as the best place and time for students to learn (Plass, Chun, & Mayer, 1998).

Researchers Hawk and Shah (2007) suggest that college teachers often rely on their own learning preferences and past student experiences when choosing teaching methods. While the idea of learning styles is controversial, it's still important for educators to consider the different learning needs of their students, even though they may have limited formal training in teaching approaches. This approach can help foster student attendance, sustain their interest, promote active engagement, and ultimately create more opportunities for effective learning to take place.

A research study led by Magulod in 2019 investigated how academic performance is linked to learning styles and study habits. The study involved 75 students from Cagayan State University in the Philippines. It used a descriptive correlation

research design to analyze the students' learning styles, study habits, and academic achievements to understand the relationships among these factors.

A separate study conducted by Jayanama in 2018 examined how different learning styles affected academic performance among students at a Thai university. The study used a mix of qualitative and quantitative methods to gather data. Results indicated that visual and tactile learning preferences may substantially impact academic success.

Over time, many research articles and presentations at conferences have explored how students prefer to learn. Understanding these preferences is important because they significantly impact how students comprehend and succeed in their studies.

Understanding different learning styles can help teachers design lessons that cater to students' preferences. By aligning teaching methods with preferred learning styles, students grasp concepts better, become more engaged, and perform better overall. This knowledge is also crucial for curriculum designers, aiding in the creation of effective and tailored learning experiences. It's worth noting that there are multiple perspectives on defining learning styles, as outlined in research literature.

For the purpose of this study, the definition provided by Felder (1996) was adopted. Learning styles are characterized as the cognitive, affective, and physiological behaviors that indicate how learners perceive, interact with, and respond to their learning environment.

Students have unique ways of learning and understanding things. Some prefer to use their eyes, while others learn best through listening, doing, thinking, feeling, breaking things down, or seeing the big picture. Teachers need to use different teaching methods to meet the needs of all students. When students' learning styles match the teacher's teaching style, students learn better. Teachers should know their students' learning styles to tailor lessons and activities to help them learn in the best way.

Teaching styles reflect a teacher's beliefs and philosophy about education. Understanding one's style can help teachers improve their methods and reach more students. Teaching style includes strategies and methods used in the classroom, as well as the use of different types of communication. Often, teachers may not be consciously aware of their own teaching style, which is a complex and evolving characteristic. As Grasha (1996) argued, a teacher's values, beliefs, and philosophy can be discerned through their teaching practices, which reflect their attitudes towards themselves, their students, and the learning and educational process.

Aim of the Study:

The aim of the study is to investigate the preferred learning styles of University students at Dhofar University. The study seeks to identify the diverse learning styles among students, including 'active' or 'reflective', 'sensing' or 'intuitive', 'visual' or 'verbal', and 'sequential' or 'global' learning. By examining these

preferences, the study aims to shed light on the importance of understanding individual learning preferences and their impact on the overall learning experience.

Problem of the Study:

The problem addressed in this study is the lack of comprehensive knowledge about the preferred learning styles of University students at Dhofar University. Understanding students' learning preferences is crucial for designing effective teaching methods and creating tailored learning environments that promote engagement and academic success. By investigating the preferred learning styles, the study aims to bridge this gap in knowledge and provide valuable insights for educational practices.

Research Questions:

1. What are the preferred learning styles of University students at Dhofar University?
2. Do the preferred learning styles differ among students enrolled in different programs of study within the College of Arts and Applied Sciences?
3. Do the preferred learning styles differ among students enrolled in different programs of study within the College of Commerce and Business Administration?
4. Do the preferred learning styles differ among students enrolled in different programs of study within the College of Engineering?
5. Are there gender differences in the preferred learning styles of University students at Dhofar University?
6. How do students' preferred learning styles influence their overall learning experience?

Objectives of the Study:

1. To determine the preferred learning styles of University students at Dhofar University.
2. To investigate if there are differences in preferred learning styles among students enrolled in different programs of study within the College of Arts and Applied Sciences.
3. To examine if there are differences in preferred learning styles among students enrolled in different programs of study within the College of Commerce and Business Administration.
4. To explore if there are differences in preferred learning styles among students enrolled in different programs of study within the College of Engineering.
5. To analyze gender differences in preferred learning styles among University students at Dhofar University.
6. To examine the influence of students' preferred learning styles on their overall learning experience.

Limitations of the Study:

1.The study's findings are limited to the specific context of Dhofar University. The sample consists of students from the colleges at Dhofar university.
2.The study collected data from 554 students.
3.The measurement of preferred learning styles relies on self-reporting by the participants.
4.The study does not extensively explore the influence of cultural factors on learning styles.
5.The study adopts a cross-sectional design, collecting data at a specific point in time.
6.The study seeks to identify the diverse learning styles among students, including 'active' or 'reflective', 'sensing' or 'intuitive', 'visual' or 'verbal', and 'sequential' or 'global' learning.

Significance of the Study:

The study is significant for the following reasons:
1.It provides insights into the preferred learning styles of University students at Dhofar University, which can help educators and institutions tailor their teaching methods to better cater to students' individual needs.
2.Understanding individual learning preferences is crucial for creating effective learning environments that enhance student engagement and academic success.
3.The findings contribute to the existing literature on learning styles, particularly in the context of Oman, and can serve as a basis for further research in the field.
4.The study highlights the importance of considering diverse learning styles in curriculum design and instructional strategies, leading to more inclusive and effective educational practices.
5.By examining gender differences in learning styles, the study contributes to the understanding of potential variations in learning preferences between male and female students, which can inform educational interventions and support systems.

Data and methods

A mixture of descriptive and multivariate statistical methods was used to achieve the objective of this study. On the descriptive part, we calculated the proportions of students in the sample who prefer each of the 8 learning styles in question. These proportions may be used to evaluate the most preferred learning style and, also, to compare the learning styles to one another in terms of preference. The results of this analysis are presented in the next section.
On the multivariate analysis part, we conducted Multivariate Analysis of Covariance (MANCOVA) to test if there is a difference in the preference for a learning style due to the college that the student is attending while controlling for the student's grade. In other words, we conducted MANCOVA to see if the preference for a learning style is dependent on the college that the student is attending while holding the effect of the variable 'grade' constant. The MANCOVA results are presented in the next section.

Sampling

The data for this study were collected from 554 students at Dhofar University, Oman. The students were enrolled on different programs of study across three Colleges. Namely, these colleges are the College of Arts and Applied Sciences (CAAS), the College of Commerce and Business Administration (CCBA) and the College of Engineering (CE). Our sample consisted of 303 female students and 251 male students. Figure 1 shows the distribution of the participants' gender across the 3 colleges.

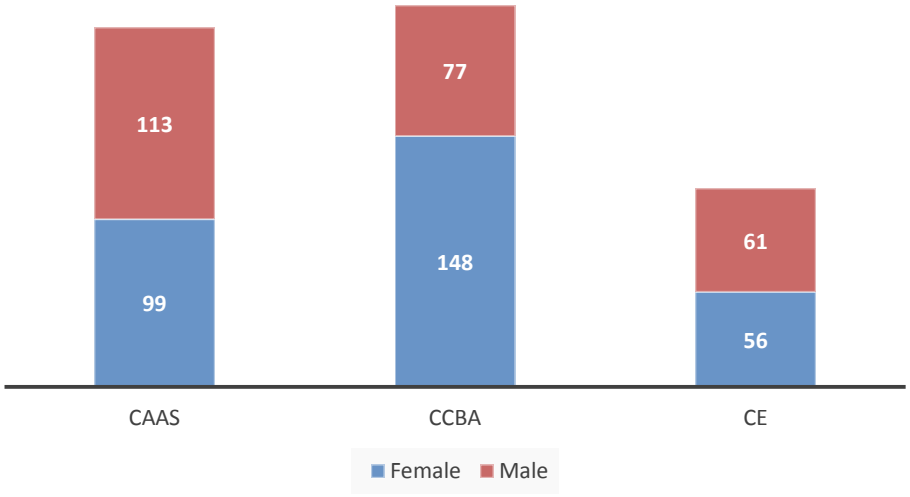


Figure 1. The distribution of the participants' gender across the colleges

We used the well-known 1994 Felder and Soloman index of learning styles to measure the participants' preferred style of learning. This index has a total of 44 close-ended questions. Each question has two provided answers from which the respondent has to choose one. The questions were designed to measure the respondent's tendency toward one of two alternate styles across four categories. These categories are: 1) 'active' or 'reflective', 2) 'sensing' or 'intuitive', 3) 'visual' or 'verbal', and 4) 'sequential' or 'global'. As a result, this setting will lead to a score on each of the 4 categories for every student in the sample (each score ranges from …. To …..). Accordingly, using these scores allowed us to classify the preferred learning style for each student in the sample to one style from every category. More details on Felder and Soloman index (including how to use the index for classification, reliability and validity) are available on http://www.ncsu.edu/felder-public/ILSpage.html.

Aside from the questions in Felder and Soloman index, we collected additional data from the study participants. The additional data were collected for the purpose of investigating whether there is a difference in the preference for the learning style, and

whether this difference can be attributed to the nature of college that the student is attending. These additional data include variables such as gender, college, and grade.

The tool of the study:

The researchers used a questionnaire as the tool of the study based on the Felder and Soloman index of learning styles to measure the participants' preferred style of learning. This index is a widely recognized and validated tool that assesses individuals' learning preferences across four dimensions: active/reflective, sensing/intuitive, visual/verbal, and sequential/global. The index consists of a questionnaire where participants indicate their preferences on a Likert scale, and the scores are used to determine their dominant learning style in each dimension.

Results

The results in this study are organized and presented for the descriptive and multivariate analyses separately. In this section, we only present the part of the results that answers the study questions and achieve the objectives of this research. For convenience, results that were deemed redundant or rather exploratory are not presented here.

Descriptive results

Table 1 displays the number and percentage (in brackets) for the students in the sample who prefer a given learning style. Recall that we have 4 categories of learning styles, and that each contains 2 alternate styles. Thus, for each category, the proportions in table 1 are calculated using the entire sample (i.e. 554 students). Looking at the figures in the table, it can be seen that: active learning (64.8%), sensing learning (46.9%), visual learning (26.2%) and sequential learning (24.4%) are more preferred as compared to their alternate styles: reflective (35.2%), intuitive (3.4%), verbal (5.4%) and global (7.4%) respectively. In addition, the numbers clearly indicate that active learning is the most ‘popular’ learning style amongst the students with an overall proportion of 64.8%. On the opposite side, it seems that the most ‘unpopular’ learning style is intuitive learning as indicated by the low proportion of 3.4% of the students who have preference for this style.

Table 1: Proportions of the preference for the different learning styles

Preference for	**NO(%)**
Reflective learning	195(35.2)
Active learning	359(64.8)
No preference	0(0)
Intuitive learning	19(3.4)
Sensing learning	260(46.9)
No preference	275(49.6)
Verbal learning	30(5.4)
Visual learning	145(26.2)
No preference	379(68.4)
Global learning	41(7.4)

Sequential learning	135(24.4)
No preference	378*(68.2)*

- The numbers in brackets are the corresponding percentages. The base for these percentages is the entire sample size (554).

Multivariate analysis results

In this analysis, we used MANCOVA as our multivariate analysis method. MANCOVA may be used to tests whether there is a difference between the means of multiple continuous variables across the levels of a categorical variable while controlling for the effect of a covariate. Recall, in our case, we have 4 scores corresponding to the 4 categories of learning style. For a given sample member, the score on any category represents their preference toward one of the 2 learning style in that category. Our objective here is to test whether there is a difference between the means of these scores across the 3 colleges (CAAS, CCBA and CE). However, since we assumed that any potential difference may, also, be attributed to the 'grade' of the student, we used MANCOVA to control for this effect.

The MANCOVA results are presented in table 2. The table displays the value of "Wilks' Lambda" test, F value, P-value and the magnitude of "Partial Eta Squared". It can see that the P-value associated with "Wilks' Lambda" is 0.026 which indicates a significant difference in the scores that represent the preference for the learning styles in question between the 3 colleges while controlling for the student's grade. In other words, holding the effect of the student's grade constant, the result shows that a student's preference to any of the learning styles is dependent on the college that the student is attending.

Another important result in table 2 is "Partial Eta squared". This gives the amount of variance in the preference scores that is accounted for by the college variable. In our case, we can see that the value of partial Eta squared is 0.12 which means that "College" as an independent variable accounts for 12% of the variability in the 4 preference scores (i.e. the dependent variables).

Table 2: The result of the MANCOVA

Test	Value	F	P-value	Partial Eta Squared
Wilks' Lambda	0.02	2.781	0.026	0.12

- The dependent variables are the 4 scores of the preference for learning styles. The independent variable is College. The covariate is the student's grade. Partial Eta Squared reflects the amount of variance in the dependent variables that is caused by the independent variable.

In this study there are 4 scores representing the preference for one of two alternative learning styles learning style ('active' or 'reflective', 'sensing' or 'intuitive', 'visual' or 'verbal', and 'sequential' or 'global'). The MANCOVA result in table 2 suggests that the preference for a learning style is dependent on the college that the student is attending if the effect of the student's grade is controlled for. However, the findings in table 2 do not indicate whether this difference is reflected in each of the 4 scores or whether it is caused by a specific score(s). Thus, table 3 presents the results of

MANCOVA follow up test that determine which scores are responsible of that difference.

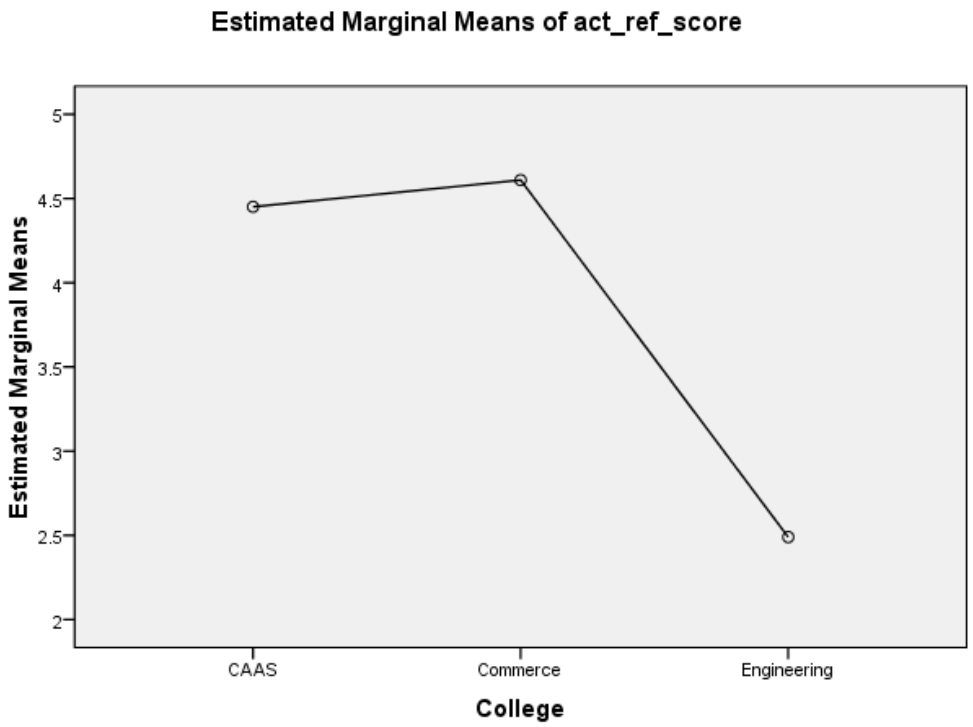
With a p-value of 0.039, the results in the table suggest one significant difference on the active-reflective score. This means that while controlling for the student's grade, the preference for a learning style depends on the college that the student is attending, but this difference is caused solely by the score of 'active or reflective' learning style. In other words, the preference for active or reflective learning style for a student can be determined by the college that the student is attending. However, the variable 'college' does not affect the student's preference for the learning styles in the other 3 categories ('sensing' or 'intuitive', 'visual' or 'verbal', and 'sequential' or 'global').

Score	Sum of Squares	df	Mean square	F	P-value
Active-Reflective	385.310	2	192.655	3.272	.039
Sensing-Intuitive	14.516	2	7.258	.537	.585
Visual-Verbal	38.851	2	19.425	1.432	.240
Sequential-Global	14.227	2	7.113	.624	.536

Table 3: MANCOVA follow up test results

- The results in the table are from the 'between-subject effects' test. df is the degrees of freedom.

Since we concluded that students attending the 3 colleges (CAAS, CCBA and CE) are different in their preference for an active and reflective learning style, it might be useful to present this difference graphically. Figure 2 displays the estimated means of the score 'active-reflective' for each college. While there is a slight difference between the CAAS and the CCBA, the figure clearly separates these two colleges from the CE. This means that the mean scores of 'active-reflective' for those who are attending CAAs and CCBA are similar, but they are both considerably different from the mean score for those who are attending the CE. We, thus, can conclude that students at the CAAS and CCBA are similar in terms of their preference for active or learning styles and they tend to differ, in that preference, from their counter parts at the CE.



Conclusion

In conclusion, this study aimed to investigate the learning preferences of university students in Oman and their impact on the students' learning approaches. The findings of this study shed light on the importance of understanding individual learning preferences and their influence on the overall learning experience.

The research showed that students in Oman have different ways of learning. Some prefer to be active and do hands-on activities, while others prefer to reflect and think about things. Some learn best by seeing images or videos, while others prefer to read and listen. Some students organize information in a logical order, while others see the big picture first. These different preferences affect how students take in information, do assignments, and get good grades.

Understanding student learning preferences is crucial for educators and schools. By considering different learning styles, educators can tailor their teaching methods and materials to match students' needs. This creates a more inclusive and effective learning environment, allowing students to engage with the material in ways that enhance their learning abilities.

Furthermore, the results highlight the importance of developing students' self-awareness about their unique learning preferences. When students understand their preferred learning styles, they can tailor their study techniques and strategies to maximize their learning experience. This self-awareness empowers students to take

charge of their education and become more active participants in their learning journey.

However, it is crucial to note that learning preferences should not be viewed as fixed traits. Students have the capacity to develop and enhance their skills in different learning styles, and educators can encourage them to explore alternative approaches to broaden their learning repertoire. Emphasizing a growth mindset and providing opportunities for students to experiment with different learning styles can foster their adaptability and versatility as lifelong learners.

Discussion

The study concludes that University students in Oman, specifically at Dhofar University, exhibit diverse preferences for different learning styles. The findings reveal that students' preferred learning styles vary in terms of being active or reflective, sensing or intuitive, visual or verbal, and sequential or global learners. These identified learning style preferences have significant implications for how students process information, engage in learning activities, and ultimately achieve academic success. The study emphasizes the importance of recognizing and understanding individual learning preferences to enhance the learning experience and promote effective educational practices.

The findings of this study provide valuable insights into the learning preferences of university students in Oman and their implications for educational practices. However, there are several considerations and limitations to keep in mind when interpreting the results.

Firstly, the study relied on self-reported data, which may be subject to response biases or inaccuracies. Future research could incorporate objective measures or observations to complement self-report measures and provide a more comprehensive understanding of students' learning preferences.

Secondly, the sample size of the study may have influenced the generalizability of the findings. While efforts were made to include a diverse range of students, it is essential to replicate the study with larger and more representative samples to ensure the validity and reliability of the results.

Additionally, the study focused on four specific learning preferences, namely 'active' or 'reflective', 'sensing' or 'intuitive', 'visual' or 'verbal', and 'sequential' or 'global' learning styles. Future research could explore additional learning styles or dimensions to capture a more comprehensive picture of students' learning preferences and their impact on academic performance.

Despite these limitations, the findings of this study contribute to the growing body of literature on learning preferences and their significance in the educational context. By recognizing and accommodating individual differences in learning styles, educators can create inclusive and effective learning environments that promote student engagement, motivation, and achievement.

Moving forward, it is recommended that educators and institutions invest in professional development programs and resources to enhance their understanding of

diverse learning preferences and effective instructional strategies. By fostering a student-centered approach to education that respects and addresses individual learning preferences, we can facilitate meaningful and transformative learning experiences for all students in Oman.

Recommendations of the Study:

Based on the results of the study, the following recommendations are provided:

1.Educators and institutions should adopt a learner-centered approach that considers and accommodates the diverse learning styles of students. This can be achieved by incorporating a variety of instructional methods and resources that cater to different learning preferences.

2.Professional development programs for teachers should include training on recognizing and accommodating various learning styles to promote more inclusive and effective teaching strategies.

3.Institutions should establish support systems and resources that enable students to explore and develop their preferred learning styles, fostering a more personalized and engaging learning experience.

4.Further research should be conducted to explore the relationship between learning styles and academic performance, as well as the effectiveness of tailored instructional approaches based on individual learning preferences.

Suggestions for Further Studies:

The study suggests the following for further studies:

1.Investigating the impact of cultural factors on learning styles among University students in Oman or explore cross-cultural differences in learning preferences.

2.Examining the relationship between learning styles and academic achievement in specific disciplines or programs of study within Dhofar University.

3.Conducting longitudinal studies to explore the stability or changes in students' learning style preferences over time and how they relate to their academic progress and success.

4.Investigating the effectiveness of implementing instructional interventions tailored to individual learning styles on student engagement, motivation, and learning outcomes.

5.Exploring the influence of other factors, such as personality traits or learning strategies, on the relationship between learning styles and academic performance.

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