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Gender And Learning Preferences In Digital Learning Platforms: A Study Of LMS Users Of Odisha State Open University

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Abstract

The integration of Learning Management Systems (LMS) has significantly transformed teaching–learning processes, particularly within open and distance learning (ODL) environments. As digital platforms increasingly mediate higher education, understanding learners' preferred learning styles becomes essential for designing inclusive and effective instructional strategies. The present study examines gender-based differences in learning style preferences among postgraduate learners at Odisha State Open University (OSOU) using the VARK (Visual, Aural, Read/Write, Kinesthetic) model. Data were collected from 140 postgraduate students (70 males and 70 females) who were active LMS users. Statistical analyses, including descriptive statistics, correlation, partial correlation, and regression analyses, were conducted using Jamovi software. The findings reveal only marginal gender-based differences in learning preferences. Female learners demonstrated slightly stronger multimodal tendencies, whereas male learners scored marginally higher in visual and aural dimensions. However, regression results indicate that gender accounts for minimal variance in learning style preferences. Overall, the findings suggest that learning styles are influenced more by individual and contextual factors than by gender alone. The study underscores the need for flexible, multimodal LMS design to support diverse learners in ODL settings.

Keywords: Learning Management System (LMS); VARK Model; Gender Differences; Learning Styles; Open and Distance Learning; Multimodal Learning

1. Introduction

Learning Management Systems (LMS) play a pivotal role in contemporary technology-mediated learning environments, particularly within online and blended modes of education. Higher education institutions increasingly rely on LMS platforms to deliver instructional content, facilitate learner interaction, and support assessment processes. A well-designed LMS fosters an inclusive learning ecosystem by enabling collaboration, self-paced learning, interactive engagement, and effective communication among learners and instructors (Watson & Watson, 2007; Means et al., 2013).

Research has consistently emphasized that learners differ in the ways they perceive, process, and engage with information. Gardner's theory of multiple intelligences and subsequent learning style frameworks highlight the diversity of cognitive preferences among learners (Gardner, 1993; Sadler-Smith, 1996). Grasha (1996) conceptualized learning styles as individual characteristics that influence how learners interact with content, peers, and instructors within instructional settings. In LMS-mediated learning,

these differences become particularly salient, as digital platforms provide multiple modes of content delivery, including text, audio, visuals, and interactive activities.

Gender has been identified as a significant variable influencing engagement, motivation, and satisfaction in online learning environments. Studies indicate that female learners often report higher levels of satisfaction and self-regulation, while male learners may demonstrate greater confidence in technology use but less consistent engagement (Garland & Martin, 2010; González-Gómez et al., 2012). Within the Indian context, open and distance learning has played a crucial role in expanding access to higher education, particularly for women from diverse socio-economic backgrounds (Saikia & Bordoloi, 2020). Despite this, empirical research examining gender differences in learning styles within LMS-based ODL institutions remains limited. Against this backdrop, the present study explores the relationship between gender and learning style preferences among postgraduate learners at Odisha State Open University (OSOU), using the VARK learning style framework.

2. Objectives of the Study

- To examine the interrelationships among Visual, Aural, Read/Write, and Kinesthetic learning styles of LMS users across gender groups.
- To analyze the association between Visual learning style and gender while controlling for Aural, Read/Write, and Kinesthetic styles.
- To examine the association between Aural learning style and gender while controlling for other learning styles.
- To analyze the association between Read/Write learning style and gender while controlling for other learning styles.

3. Theoretical Perspective and Review of Literature

Prior research has established that gender influences learner engagement and experiences in online learning environments, though findings remain mixed. Garland and Martin (2010) observed that male and female learners demonstrate distinct patterns of interaction with online learning tools, with females often reporting higher satisfaction levels. González-Gómez et al. (2012), in a large-scale study, found that female students exhibited greater engagement with e-learning platforms compared to their male counterparts. Other studies suggest that gender interacts with age, life stage, and socio-cultural responsibilities. Mature female learners often demonstrate stronger self-regulation and time-management skills, shaped by balancing academic, professional, and family roles (Richardson & Woodley, 2003). Conversely, younger male learners may exhibit overconfidence, leading to sporadic engagement and lower persistence.

At the same time, research on technology adoption suggests that gender gaps in ICT usage have narrowed significantly, as both men and women increasingly integrate digital tools into professional and personal contexts (Rainer et al., 2003). However, Li et al. (2008) emphasize that gender differences in digital learning adoption remain underexplored in developing countries, particularly within ODL systems.

4. The Vark Model

There is an ongoing discussion on the utility of models like VARK as a popularly accepted model by both educators and students to tailor teaching -learning instructional approach (Yotta, 2023). This approach enables educators to apply learning styles in real-time, facilitating a deeper understanding of how students prefer to interact with course material (Cabual,2021). The VARK model segregate learners

based on their sensory preferences such as visual, auditory, read/write, and kinesthetic (Hernandez et al., 2020). These multi classifications highlight the multi-dimensional nature of learning preferences, emphasizing that students often prefer a combination of styles rather than a single, fixed type (Masitowarni & Haswani, 2020). Research has proven the fact that coordination between a student's learning style and the instructional approach can significantly enhance academic performance and satisfaction (Tom & Calvert, 1984). This correlation not only fosters higher involvement with the subject matter but also promotes self-managed learning skills, which are particularly beneficial in novel educational contexts like problem-based learning (Phuong et al., 2018). The VARK (Visual, Aural, Read/Write, Kinesthetic) model is a widely accepted model for individual learning preferences, suggesting that learners assimilate information most effectively through specific sensory modalities. These modalities bounded by Visual (V), Auditory (A), Read/Write (R), and Kinesthetic (K) preferences, each representing a distinct way in which individuals prefer to receive and process new information (Sayed et al., 2022). Understanding these preferences is crucial for tailoring educational strategies to optimize learning outcomes across diverse student populations (Pashler et al., 2008). To understand how gender influences learning preferences in an LMS environment, the VARK model offers a useful framework for categorizing these preferences.

5. Research Gap

Most existing studies on gender and learning styles are situated within conventional universities or generalized e-learning environments. Empirical evidence focusing on LMS-based learning style preferences among postgraduate learners in Indian open universities remains limited. Moreover, prior studies often rely on descriptive comparisons without employing partial correlation or regression analyses to control for overlapping learning styles. The present study addresses these gaps by systematically examining gender–learning style relationships among active LMS users at Odisha State Open University.

6. Significant of the study

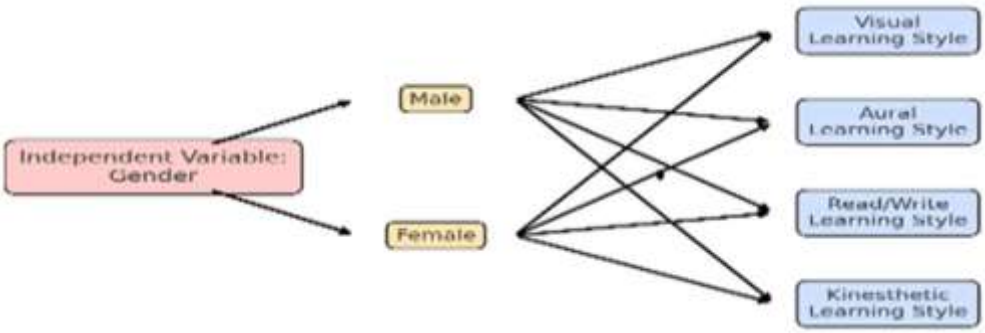
The study contributes to a deeper understanding of learner diversity within LMS-mediated ODL environments. By providing empirical evidence on gender and learning style preferences, the findings inform gender-sensitive and inclusive instructional design. The results are particularly relevant for academic planners, LMS designers, and faculty members seeking to enhance learner engagement, retention, and satisfaction in open universities.

7. Methodology

The study adopts a cross-sectional descriptive and correlational research design with comparative and predictive components. The VARK learning style model serves as the theoretical framework. Data were collected from postgraduate learners who were active LMS users with at least six months of platform engagement. A purposive sampling approach was followed, and random subsampling ensured equal gender representation (70 males and 70 females).

A self-developed, expert-validated VARK-based questionnaire was used for data collection. Statistical analyses including descriptive statistics, Pearson correlation, partial correlation, and multiple regression were conducted using Jamovi software, with Microsoft Excel used for data preprocessing.

Diagram 1.1. Gender and Learning style framework



7.1 Sampling

The total number of registered students in the Post Graduate in February 2025 batch was 187. The sample selected purposively based on the sub-criteria of informed consent to participate in the research process, 157 students filled out the questionnaire, comprising 85 females and 70 males. To equalize the groups, random subsampling was applied. Female cases (n = 85) were assigned random numbers using the =RAND () function in Excel, sorted, and 15 were excluded, resulting in balanced groups of 70 males and 70 females.

7.2 Tools

The study employed a VARK-based Learning Styles Questionnaire, which was self-developed in alignment with the Visual, Aural, Read/Write, and Kinesthetic framework. The instrument was subjected to expert validation to ensure content relevance and clarity. For data analysis, Jamovi statistical software was used owing to its robustness in handling correlational and regression analyses. Microsoft Excel was utilized for initial data coding, data cleaning, and random subsampling procedures to maintain gender balance in the sample.

7.3 Techniques

Both descriptive and inferential statistical techniques were applied to analyze the data. Descriptive statistics, including mean and standard deviation, were used to summarize learning style preferences across gender groups. Pearson's correlation analysis was conducted to examine the interrelationships among the four VARK learning styles. To isolate the effect of gender on each learning style, partial correlation analysis was employed by statistically controlling the remaining learning style variables. Further, multiple regression analysis was used to assess the predictive influence of gender on learning style preferences. Comparative analysis was carried out to identify variations between male and female LMS users.

7.4 Models used

The study was theoretically grounded in the VARK Learning Styles Model, which categorizes learners based on their preferred sensory modalities Visual, Aural, Read/Write, and Kinesthetic. In addition, a Gender–Learning Style Analytical Framework was developed to examine both direct associations and controlled relationships between gender and learning styles within an LMS environment.

7.5 Sources of data collection

The study relied on both primary and secondary sources of data. Primary data were collected through an online questionnaire administered to LMS users of Odisha State Open University. Secondary data were gathered from books, peer-reviewed journals, policy documents, LMS-related reports, and previous empirical studies relevant to learning styles, gender, and digital learning environments.

7.6 Case study

Odisha State Open University (OSOU) was selected as the case institution, focusing on its LMS platform used by postgraduate learners. The study examines learner interactions and learning style preferences within this specific institutional and technological context.

7.7 Procedural framework

The research followed a systematic procedural framework. Initially, the research problem was identified and objectives were clearly defined. This was followed by an extensive review of literature, leading to the selection of the VARK model as the theoretical foundation. Subsequently, the research tool was developed and validated by subject experts, and a pilot test was conducted to assess its suitability. After finalizing the sample, data were collected through an online survey. The collected data were then coded and analyzed using Jamovi statistical software. Finally, the results were interpreted in light of the research objectives, and conclusions were drawn.

7.8 Strategy of Investigation

The study adopts a cross-sectional descriptive and correlational research strategy, combining comparative and predictive approaches. Gender was treated as the independent variable, while learning styles were dependent variables. Statistical controls were applied to isolate the effect of gender on individual learning styles.

8. Data analysis and Results

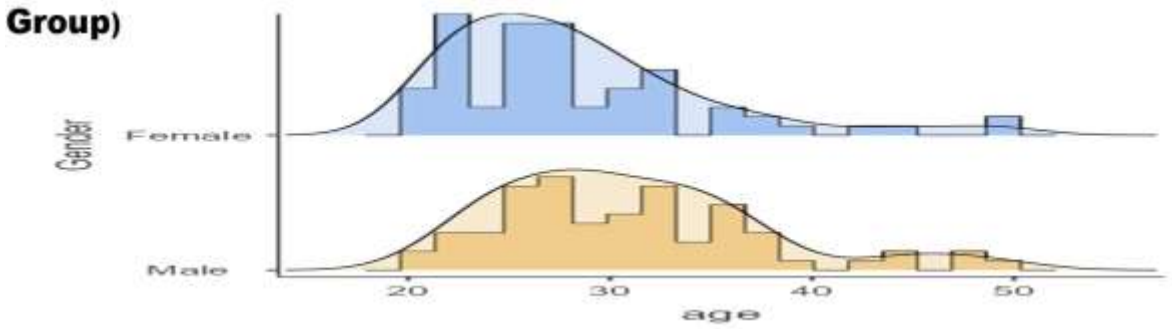
Data analysis and visualization were carried out using the free statistical software jamovi. The survey questionnaire consisted of a total of 50 items, which were categorized according to the VARK scoring key. The Visual learning style was represented by 14 items (Q1–Q14), the Aural learning style by 13 items (Q15–Q27), the Read/Write learning style by 13 items (Q28– Q40), and the Kinesthetic learning style by 10 items (Q41–Q50). For each respondent, the total scores for these categories computed by summing the relevant item responses, thereby generating four composite variables reflecting their learning style preferences.

8.1 Demographic Profile

The demographic distribution of respondents was examined with respect to age and gender. The sample comprised 140 respondents, equally divided between males (n = 70) and females (n = 70), ensuring balanced representation across gender groups. The age distribution revealed noticeable differences between male and female respondents (Figure 1.1.). Among females' learners, the majority were concentrated within the 22–28-year age bracket, reflecting a younger profile. The distribution exhibited a steep peak in the early twenties and gradually tapered off, with only a few learners above the age of 40. In contrast, the male respondents displayed a broader age spread. The highest concentration was observed in the 25–35-year range**,** but unlike females, a significant proportion of males extended into the 40–50-year group**.** The male age distribution was flatter and more dispersed, indicating greater variability and sustained participation across different life stages. A comparative inspection highlights that females are more narrowly distributed around younger ages**,** whereas males show representation across a wider spectrum**,** including middle-aged groups. These variations imply potential age–gender interactions

in learning style preferences, underlining the importance of controlling for both variables in subsequent statistical analyses.

Chart 1.1. Demographic Profile of Respondents (Gender vs. Age



(Source: Primary Data Collected Through survey questionnaire)

8.2 VARK Learning Score

Table 1.1 presents the descriptive statistics (Mean, SD, N) for male and female students across the four learning style dimensions reveal some interesting patterns. With equal sample sizes (N = 70 for each group), the mean scores indicate that gender-based variations exist but are not very large. For kinesthetic learning, males (M = 41.9, SD = 4.69) and females (M = 41.2, SD = 5.3) scored almost identically, suggesting that hands-on, experiential learning is equally preferred across both genders. In the read/write dimension, males (M = 46.6, SD = 6.09) scored marginally higher than females (M = 45.7, SD = 7.51), though the greater variability among females reflects wider individual differences in this learning preference. A more notable difference is seen in visual learning, where males (M = 55.5, SD = 7.86) scored higher than females (M = 53, SD = 7.26), indicating that visual aids, diagrams, and charts may be slightly more effective for male learners. In the aural dimension, males (M = 48, SD = 7.33) again showed a small advantage over females (M = 46.8, SD = 8.52), though the higher standard deviation for females suggests considerable diversity within that group. Overall, the results highlight subtle gender variations, with males tending to score higher in visual and aural preferences, while kinesthetic and read/write styles appear relatively balanced. However, the overlapping standard deviations across all dimensions suggest that individual differences within each gender are greater than the differences between genders, underscoring the need for inferential statistical testing to confirm the significance of these observed patterns.

Table 1.1. VARK Learning Style Scores for P.G Students, OSOU, February 2025 Batch

Descriptive Statistics	Gender	Sum of the Kinesthetic	Sum of R/W	Sum OF Visual	Sum of Aural
N	Male	70	70	70	70
	Female	70	70	70	70
Mean	Male	41.9	46.6	55.5	48
	Female	41.2	45.7	53	46.8
Standard deviation	Male	4.69	6.09	7.86	7.33
	Female	5.3	7.51	7.26	8.52

Total number of respondents =140, out of which Male (N = 70) Female (N = 70)

(Source: Primary Data Collection Through survey questionnaire)

8.3 Co-relation Matrix between VARK learning Styles

Table 1.2. demonstrates that Aural learning has a very strong associations with Read/Write (r

≈ .80, p < .001) and Visual (r ≈ .77, p < .001), while maintaining a moderately strong relationship with Kinesthetic (r ≈ .65, p < .001). The Read/Write style also correlated highly with Visual (r ≈ .71, p < .001) and Kinesthetic (r ≈ .67, p < .001). Similarly, Visual learning showed a moderate positive association with Kinesthetic (r ≈ .54, p < .001). These results suggest that male LMS users tend to adopt a multimodal learning orientation, where auditory, textual, and visual strategies are often combined and reinforced through experiential (kinesthetic) modes. The particularly strong linkage between Aural and Read/Write indicates that male learners may benefit substantially from LMS features that integrate listening (e.g., recorded lectures, podcasts) with textual content (e.g., e-resources, discussion forum

Table 1.2. Pearson Co-Relation Matrix Between Aural, Visual Reading/Writing and Kinaesthetic

Correlation Matrix

		Sum of Aural	Sum OF Visual	Sum of R/W	Sum of the Kinesthetic
Sum of Aural	Pearson's r	—			
	df	—			
	p-value	—			
Sum OF Visual	Pearson's r	0.774***	—		
	df	138	—		
	p-value	< .001	—		
Sum of R/W	Pearson's r	0.803***	0.714***	—	
	df	138	138	—	
	p-value	< .001	< .001	—	
Sum of the Kinesthetic	Pearson's r	0.657***	0.537***	0.667***	—
	df	138	138	138	—
	p-value	< .001	< .001	< .001	—

Note. * p < .05, ** p < .01, *** p < .001

8.4 Gender-wise Correlation of Learning Styles

The separate data sets were examined for male and female sers; some interesting differences emerged. Among female learners, the connections between the four learning styles were very strong. For instance, those who preferred a kinesthetic style also showed strong preferences for Read/Write (r = .80), Visual (r = .74), and Aural (r = .80). Likewise, Read/Write learners were closely linked with both Visual (r = .75) and Aural (r = .79), and Visual was strongly related to Aural (r = .79). What this tells us is that women in the sample tended to combine different approaches quite fluidly. Instead of leaning on one mode alone, their learning habits overlapped and reinforced each other, pointing toward a more blended or multimodal way of using the LMS. The picture for male learners was slightly different. Their correlations were still strong but a little lower than those of the female group. Kinesthetic learning connected with Read/Write (r = .78), Visual (r = .70), and Aural (r = .76). Read/Write again showed ties with Visual (r = .72) and Aural (r = .75), and Visual correlated with Aural (r = .74). While men also showed multimodal tendencies, the links were not as tight as in the female group. This suggests that male

learners kept their learning preferences a bit more separate, showing clearer distinctions between styles even though the overlap was still present.

1.3. Pearson Correlation Matrix — Female LMS Users

Variable	1	2	3	4
1. Kinesthetic	—	.80***	.74***	.80***
2. Read/Write		—	.75***	.79***
3. Visual			—	.79***
4. Aural				—

(Source: Primary Data Collection Through survey questionnaire)

1.4. Pearson Correlation Matrix — Male LMS Users

Variable	1	2	3	4
1. Kinesthetic	—	.78***	.70***	.76***
2. Read/Write		—	.72***	.75***
3. Visual			—	.74***
4. Aural				—

(Source: Primary Data Collection Through survey questionnaire)

8.5 Partial Correlation of the Four VARK Learning Styles with Gender

The present findings indicate that, among the four VARK learning styles, only Visual learning style showed a significant partial correlation with gender when the other three styles were statistically controlled. Specifically, the negative relationship ($r = –.175$, $p = .041$) suggests that one gender group may score relatively lower on Visual learning preferences compared to the other. This aligns with previous studies which have reported gender-based variations in preferred modes of learning, where female learners have often been observed to rely more on reading/writing and auditory strategies, while male learners tend to prefer kinesthetic or practical modes of engagement (e.g., Wehrwein et al., 2007; Slater et al., 2007).On the other hand, the absence of significant partial correlations for Aural, Read/Write, and Kinesthetic learning styles implies that gender alone is not a strong predictor of these learning preferences when other learning modalities are accounted for. This reinforces the notion that learning styles are multi-dimensional and are influenced by a complex interplay of cognitive, social, and contextual factors rather than being determined by demographic characteristics such as gender alone. Taken together, the findings highlight the importance of considering individual variation in learning preferences rather than making broad generalizations based on gender. Educational interventions should therefore be designed to accommodate a variety of learning approaches, with an emphasis on inclusive

pedagogical practices that provide equal opportunities for learners across different genders.

Table 1.5. Partial Correlation between Gender and VARK Learning Styles

	Aural	Visual	Read/Write	Kinesthetic
gender				
Pearson's r	0.059	-0.175	0.036	-0.025
p-value	0.490	0.041	0.676	0.776

(Data has been calculated by partial out one learning style at a time)

8.6 Multi-Regression Modelling for Learning Styles and Gender, Age Co-Relation

To study the effect of gender on learning style, a multi-regression modelling was employed to see gender could significantly become a predictive factor for four learning syles visual, aural, Read/Write and Kinesthetic. The results indicated that gender accounted for minimal variance in any of the models, with R^2 values ranging from .004 to. 028.For the Visual learning style, the model reached statistical significance, F (1, 138) = 3.95, p = .049, with gender explaining about 2.8% of the variance. The regression coefficient for gender was negative (B = –2.54, SE = 1.28, t = –1.99), suggesting that scores differed slightly between males and females, with females tending to score lower on visual preference. Although there is a significance visual learning style with gender relation but the effect was negligible. In contrast, the models for Aural (F (1, 138) = 0.78, p = .379, R^2 = .006), Read/Write (F (1, 138) = 0.65, p = .423, R^2 = .005), and Kinesthetic (F(1, 138) = 0.63, p = .429, R^2 = .005) were not significant. For each of these styles, gender did not predict learning preferences, as indicated by nonsignificant regression coefficients (all p > 0.05). Overall, these results indicate that there is little correlation between gender and learning style preferences. Although there was a slight difference in the Visual domain, it was not significant and clarified only slightly the variation. Practically speaking, its appear that there is no significant difference between genders in terms of learning style preferences.

1.6. Regression Analysis of Gender, Age and Learning Styles

Outcome	Predictor	Estimate	95% CI	t-value	p-value	Std. Estimate	Interpretation
R/W	Intercept	41.780	36.0691 to 47.490	14.467	<.001	–	Significant baseline value
R/W	Gender	-0.493	-2.8155 to 1.830	-0.420	0.675	-0.0362	Negative, not significant
R/W	Age	0.156	-0.0204 to 0.333	1.750	0.082	0.1509	Positive, not significant
Visual	Intercept	49.559	43.260 to 55.858	15.56	<.001	–	Significant baseline value

Visual	Gender	-2.008	-4.570 to 0.554	-1.55	0.124	-0.132	Negative, not significant
Visual	Age	0.192	-0.003 to 0.387	1.95	0.053	0.166	Positive, marginal significance
Aural	Intercept	42.381	35.749 to 49.014	12.635	<.001	–	Significant baseline value
Aural	Gender	-0.681	-3.379 to 2.017	-0.499	0.619	-0.043	Negative, not significant
Aural	Age	0.181	-0.024 to 0.387	1.746	0.150	0.150	Positive, not significant
Kinesthetic	Intercept	38.794	34.605 to 42.982	18.315	<.001	–	Significant baseline value
Kinesthetic	Gender	-0.396	-2.100 to 1.307	-0.460	0.646	-0.040	Negative, not significant
Kinesthetic	Age	0.099	-0.031 to 0.228	1.507	0.134	0.130	Positive, not significant

Outcome	R	R^2	F	df1	df2	p
Visual	0.144	0.0208	1.45	2	137	0.237
Aural	0.162	0.0264	1.86	2	137	0.16
Kinesthetic	0.233	0.0541	3.91	2	137	0.022
Read/Write	0.165	0.0272	1.92	2	137	0.151

(Data collected through survey questionnaire)

8.7 Discussion of Findings

The response comes from a survey conducted on MA sociology February 2025 learners at Odisha State Open University, the regression analysis indicates that gender contributes very little to predicting any of the four VARK learning styles. The R^2 values range from 0.004 to 0.028. This suggests that gender alone does not play a significant role in learning style preferences when we consider other factors. This finding aligns with the study "Gender Influence on Students' Learning Preferences: An Assessment of the Learning Styles of Postgraduate Students at African International University" by Francisca Wavinya Ngala, which used the Grassa Richman model.

Visual learning style significantly affects gender, especially among male learners. The results vary for female learners. This finding differs from a study by Rogers (1995), which found that girls typically prefer colorful and detailed pictures featuring people, plants, and animals. In contrast, boys usually favor images that depict action and adventure, like vehicles and fighting scenes. Similarly, Rosati (1997) states that in engineering education, both male and female students prefer visual learning. However, females tend to have a stronger preference for verbal and reflective learning.

Research supports this pattern. Female students show tendencies to engage in multiple learning modes concurrently, such as blending kinesthetic and auditory or visual and read/write approaches. This multimodal preference for females contrasts somewhat with male learners, whose correlations among learning styles are generally strong but less pronounced, suggesting a less overlapping or integrated use of different learning styles. (Buowari, Joe, & Erekosima)

Although this study focuses on sociology students, research on medical and undergraduate cohorts shows that females tend to adopt more flexible and diverse learning strategies, while males often rely on narrower, less integrated styles, though they also display some multimodal preferences (Bin Eid et al., 2021). The present analysis, however, did not find gender to be a significant predictor for any of the four learning style dimensions (Read/Write, Visual, Aural, and Kinesthetic). Across all models, gender coefficients were negative but non-significant, suggesting that in this group, learning style preferences do not differ meaningfully between males and females.

8.8 Conclusion

The findings of the study indicate that gender has a negligible influence on learning style preferences among postgraduate LMS users at Odisha State Open University. While minor differences were observed particularly in visual learning preferences the overall variance explained by gender was minimal. These results suggest that learning styles are shaped more by individual, contextual, and pedagogical factors than by gender alone. Consequently, LMS design and instructional strategies should prioritize multimodal and flexible learning environments rather than gender-based assumptions.

8.9 Research Limitations and Suggestions for Future Research

The present study has certain implicit limitations that should be acknowledged:

- While the Learning Management System (LMS) was recognized as a tool for addressing diverse learning styles, the study did not assess the platform's features, usability, or overall quality as dependent variables. Consequently, the potential influence of LMS design on learning style preferences and outcomes remains unexplored. The study was conducted among Master's degree students at Odisha State Open University. The findings are therefore specific to this demographic and institutional context, which may limit their generalizability to other educational levels, institutions, or cultural backgrounds.
- The reliance on a quantitative approach, primarily the VARK questionnaire and regression analysis, provides statistical associations but does not capture the deeper nuances of how or why certain learning style preferences manifest, particularly the multimodal tendencies observed among female learners.
- The study emphasized gender as the main predictor variable and concluded that its effect on learning styles was "very negligible". This highlights that other factors, which were not the focus of this research, may play a more substantial role in shaping learning preferences.

8.10 Suggestions for Future Research

Building upon these limitations, future studies could consider the following directions:

- Further research should investigate cognitive, social, and contextual variables beyond demographics such as gender. This would contribute to a more comprehensive understanding of what influences learning styles.
- To better understand multimodal preferences, particularly the ways in which male and female learners integrate various styles, qualitative or mixed-methods approaches (e.g., interviews, focus groups, classroom observations) would be beneficial.
- Future investigations could examine how specific LMS features—such as adaptive quizzes, interactive discussion forums, and multimedia tools—affect learning style accommodation and learner satisfaction.
- Since cultural contexts and socio-economic factors may shape digital learning readiness, comparative studies across different cultural and educational settings could test the generalizability of the findings.
- Long-term research designs could provide insights into how learning styles evolve over time, particularly in response to sustained exposure to online learning environments, thereby complementing the current study's cross-sectional approach.

8.11References

- Beaman, C. P., & Harvey, A. J. (2005). Access to online resources: A case study. Psychology Learning & Teaching, 5(1), 47–51. https://doi.org/10.2304/plat.2005.5.1.47
- Buowari, D. Y., Joe, A. I., & Erekosima, I. (2025). Learning style preference and its correlation with gender. Nigerian Medical Journal, 66(1), 303–312. https://doi.org/10.71480/nmj.v66i1.720
- Burke, R. J., Vinnicombe, S., Michie, S., & Nelson, D. L. (2006). Barrier's women face in information technology careers: Self-efficacy, passion and gender biases. Women In Management Review, 21(1), 10–27. https://doi.org/10.1108/09649420610643385
- Dabbagh, N., & Kitsantas, A. (2012). Personal learning environments, social media, and self-regulated learning: A natural formula for connecting formal and informal learning. The Internet and Higher Education, 15(1), 3–8. https://doi.org/10.1016/j.iheduc.2011.06.002
- Dede, C. J., Jacobson, J., & Richards, J. (2017). Introduction: Virtual, augmented, and mixed realities in education. In D. Liu, C. Dede, R. Huang, & J. Richards (Eds.), Virtual, augmented, and mixed realities in education. Smart Computing and Intelligence (pp. 1–16). Springer Nature Singapore. https://doi.org/10.1007/978-981-10-5490-7_1
- Garland, M. R., & Martin, B. N. (2010). Do gender, learning style, or age influence teaching online? A study of online university faculty. Journal of Online Learning and Teaching, 6(2), 297–313.
- González-Gómez, F., Guardiola, J., Martín-Rodríguez, O., & Montero-Alonso, M. A. (2012). Gender differences in e-learning satisfaction. Computers & Education, 58, 283–290. https://doi.org/10.1016/j.compedu.2011.08.017
- Kasabova, G., Parusheva, S., & Bankov, B. (2023). Learning management systems as a tool for learning in higher education. Economic Sciences Series, 12(2), 224–233. https://doi.org/10.56065/IJUSV-ESS/2023.12.2.224
- Kasabova, V., Parusheva, S., & Bankov, G. (2023). The importance of learning management systems in

digital education. Journal of Innovations in Digital Learning, 12(3), 45–59.

- Kaushik, M., & Agrawal, D. (2020). Factors influencing the adoption of digital learning platforms among Indian students. International Journal of Education and Development using Information and Communication Technology (IJEDICT), 16(3), 98–116.
- Lau, W. W. F., & Yuen, A. H. K. (2010). Gender differences in learning styles: Nurturing a gender-sensitive classroom using ICT. Australasian Journal of Educational Technology, 26(7), 1184–1196.
- Li, N., Kirkup, G., & Hodgson, B. (2008). Cross-cultural comparison of women students' attitudes toward the Internet and usage: China and the United Kingdom. CyberPsychology & Behavior, 11(2), 273–275.
- Little-Wiles, J., Fernandez, K., & Fox, J. (2012). Ethical decision making in online learning: Gender, learning style, and achievement. Journal of Online Learning and Teaching, 8(2), 110–118.
- Means, B., Toyama, Y., Murphy, R., & Bakia, M. (2013). The effectiveness of online and blended learning: A meta-analysis of the empirical literature. Teachers College Record, 115(3), 1–47. https://doi.org/10.1177/016146811311500307