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Understanding the Learning Style Preferences of ODL Students using VARK Model: Implications for Individualized Pedagogy and Student Success

ABSTRACT

Aims: The study aims to assess the learning styles among ODL students in higher education, and propose practical strategies for integrating personalized learning approaches to enhance student engagement and educational outcomes.

Place and Duration of Study: Research was carried out among the higher education students who enrolled in different ODL programs under the dual-mode universities. Survey was administered during Personal Contact Programme (PCP) for the academic session of 2023-2024.

Methodology: Descriptive survey design was employed to gather quantitative data on higher education students learning styles under ODL mode of study and provides a deeper understanding of ODL students' learning preferences based on VARK model. The sample comprised of 246 post-graduate ODL students from various disciplines. A simple random sampling technique was employed to ensure representation from diverse academic backgrounds of ODL students.

Results: Study revealed significant variations in learning style preferences among the ODL students. There are 89 (36.18%) ODL students with single preference of learning style and 157 (63.82%) ODL students with multimodal preference of learning style. Statistically significant difference found between male and female ODL students concerning their learning styles. Visual learning style is the most preferred learning style, followed by aural, kinesthetic, and read/write learning style respectively. Majority of ODL students preferred to learn by multiple sensory modalities.

Conclusion: Integrating learning style assessments into distance learning practices holds immense promise for enhancing the effectiveness and efficiency of distance education. Designing course curriculum for distance education based on multiple sensory modalities is crucial for enhancing learning outcomes and student engagement. Incorporating various sensory channels such as visual, auditory, kinesthetic, and read/write, ODL professionals can cater to diverse learning styles and preferences, ultimately promoting a deeper understanding of the subject matter and academic success.

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Keywords: Learning Style, ODL Students, Higher Education, Individualized Pedagogy, Student Success

1. INTRODUCTION

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Learning involves a process of seeing, observing, and understanding something, which turns into understanding knowledge [1]. Different learners learn differently [2]. All students have their own learning styles [3]. Understanding students' learning styles is vital because it allows educators to build instructional strategies based on individual preferences. Depending

22 on whether the students learn best as visual, auditory, or kinesthetic learners, or by other
23 learning methods, instructors can create inclusive learning methods that integrate needs for
24 all types of learners. This in turn, promotes a high level of engagement, which is necessary
25 for optimal retention and comprehension and hence promotes students' success. Learning
26 style describes the distinctive qualities and preferences of learners regarding how they
27 process information and react to environmental stimuli [4]. It is a pattern of behaviour
28 developed for new learning. This approach of learning emphasises how differently people
29 receive and process information. Due to the variations in cognitive processing, learning
30 processes change from person to person [5]. Learning style for students is the preferred way
31 to learn something new [2]. It is also how students understand and remember knowledge. It
32 has an important effect on the learning processes of the students, which influences the
33 outcomes of learning [6]. When the students are interested, it encourages them to continue
34 learning. Students can acquire more information faster if they are aware of their preferred
35 learning style [7]. Thus, understanding learning styles is important for educators who seek to
36 enhance teaching and learning outcomes.

37 It is important for higher education students to build their own learning potential in order to
38 the career learning process [8]. The Open and Distance Learning (ODL) system has
39 significantly improved access to quality higher education in India [9]. Therefore, recognising
40 the learning style is extremely important in an Open and Distance Learning (ODL)
41 environment where students learn separately at home and feel alienated from their friends
42 and teachers [10]. Different learning styles are adopted by students in distance learning
43 systems depending on their individual backgrounds and the inputs they receive from their
44 teacher [4]. Investigating the various learning styles of ODL students in higher education is
45 worthwhile, especially considering the instructional inputs. Research indicates that every
46 student most commonly modifies his, or her own learning style based on the environmental
47 or classroom context [11]. It has been discovered that learning styles influence students'
48 learning behaviours [5]. Amongst the factors that contribute to the achievement of distance
49 learners are accessibility, application of suitable methodology, course content, learning
50 material and criteria for assessment. Learning style is another important aspect that
51 contribute to the success of students' learning through ODL mode of study [6]. Teachers
52 need to understand students' learning strategies in order to assist their learning [11].
53 Information regarding learner preferences for learning can help the professionals become
54 aware to the diversity that students bring to the classroom [12]. By assessing students'
55 learning styles in an ODL setting, the findings can help teachers to develop and execute
56 distant learning-specific teaching approaches to boost student motivation and learning.
57 Consequently, student responses can help ODL professionals to figure out how to make
58 studying more engaging for ODL students in order to stimulate their interest and inspire them
59 to learn. For this reason, determining the preferred learning style of each student is
60 important for creating a curriculum that is both effective and engaging. Understanding each
61 student's abilities, prior knowledge, preparedness, interests, and dedication will help the
62 teacher provide effective instruction and possibly improve the learner's learning process [8].
63 This study, therefore, aims at depicting the learning style preferences of ODL students in
64 higher education setting under the dual-mode university. Then, adjustments can be made to
65 meet the varied needs of the students [5].

66 **2. RATIONALE OF THE STUDY**

67 Learning preferences have been associated indirectly to students' academic success.
68 Student performance might be correlated with learning preferences, or styles. Most students
69 have a preferred way to learn. Some people learn best while listening, some people need to
70 see something being done first, while others must do it to learn it. The thing is, everyone
71 needs all four modalities to truly commit information to memory: visual, auditory, read/write

72 and kinesthetic. Therefore, it is essential to identify learning styles with the aim of ensuring
73 that a teacher instructs according to the learner's learning style. A teacher who teaches only
74 the way they learn makes learning difficult for the person they are instructing. However,
75 teachers should have necessary knowledge regarding learning styles to assist learners to
76 identify the best styles for them. Additionally, it will enable individuals to develop their self-
77 esteem and learn how to manage their learning, especially in an ODL environment. Although
78 every student has their own preferred learning style, it is crucial to have some ideas about
79 others and how to strengthen weaker styles. Utilizing multiple learning styles can strengthen
80 learning experiences; therefore, student success in a distance learning environment may
81 depend on understanding the learning style. Students will not just expect equal opportunity
82 to an excellent education as traditional offerings, but they want a learning experience on
83 their own. Therefore, this study aimed to find out the most preferred learning styles for ODL
84 students in higher education under the dual-mode university. Understanding learners'
85 preferences for visual, auditory, reading/writing, and kinesthetic modalities enables ODL
86 professionals to design and deliver learning material in alignment with these preferences,
87 thereby enhancing student engagement, motivation, and academic performance. Therefore,
88 understanding the preferred learning styles and cognitive abilities will enable the ODL
89 professionals to optimize the learning experience for ODL students.

90 **3. RESEARCH QUESTIONS**

- 91 1. What are the learning style preferences found in ODL students at higher education
92 level?
- 93 2. Is there any gender difference in learning styles among the ODL higher education
94 students?

95 **4. PURPOSE OF THE STUDY**

96 This study attempts to fill the gap in student learning styles research by investigating the
97 preferred learning styles of ODL students to develop and implement teaching approaches
98 that are specific in distance learning setting to increase students' motivation and learning.
99 Thus, the specific objectives of this study sought to investigate:

- 100 1. To study the learning style preferences of ODL students at higher education level.
- 101 2. To compare the learning styles of ODL higher education students in respect to their
102 gender.

103 **5. METHODOLOGY**

104 This study employed a descriptive survey research design to explore the learning styles of
105 higher education students and to provide a comprehensive understanding of ODL students'
106 learning preferences.

107 **5.1 Population of the Study**

108 The population consisted of all the post-graduate students enrolled in the ODL section under
109 the dual-mode university in West Bengal.

110 **5.2 Sample and Sampling Technique**

111 The participants in this study were post-graduate ODL students enrolled in diverse
112 disciplines under the dual-mode university. A simple random sampling method was

113 employed to ensure representation from different academic disciplines. The sample
114 consisted of 246 final year post-graduate students under the ODL mode of study in the main
115 campus of the dual-mode university in the state of West Bengal.

116 **5.3 VARK Instrument**

117 The research utilizes version 7.1 of the VARK questionnaire, developed by Neil Fleming, to
118 assess individual learning preferences across four modalities: Visual (V), Auditory (A),
119 Reading/Writing (R), and Kinesthetic (K) [13]. It encompasses 16 questions, each with four
120 options. Learners were permitted to select more than one response per item to appropriately
121 describe their preferred response in a particular situation. The function of each item is to
122 categorize the respondent's learning style preference. This questionnaire helps to identify
123 how individuals best absorb and process information, thereby promoting more individualized
124 and efficient learning experiences.

125 **5.4 Data Collection and Statistical Analysis**

126 The hard-copy of the VARK questionnaire downloaded from the VARK official website was
127 distributed to the ODL students during their personal contact programme in October 2023. A
128 total three hundred questionnaires were distributed to the ODL students who were available
129 at the time of the research study. A total of 246 questionnaires were completed and
130 submitted by the ODL students. The students were informed that the VARK questionnaire
131 was prepared to assess the learning style preferences of the students, participation is
132 voluntary in this study and, study results would not be used for any other dissemination other
133 than the research purposes.

134 The VARK learning style preferences were calculated using the guidelines provided on the
135 VARK website. The VARK questionnaire was evaluated using the stepping-stone method as
136 described on the VARK website. Each VARK component was analyzed using descriptive
137 statistics. To compute the proportion of ODL students for each VARK component, the
138 number of students who favoured each modality of learning was divided by the total number
139 of ODL students (n=246).

140 **6. RESULTS AND DISCUSSION**

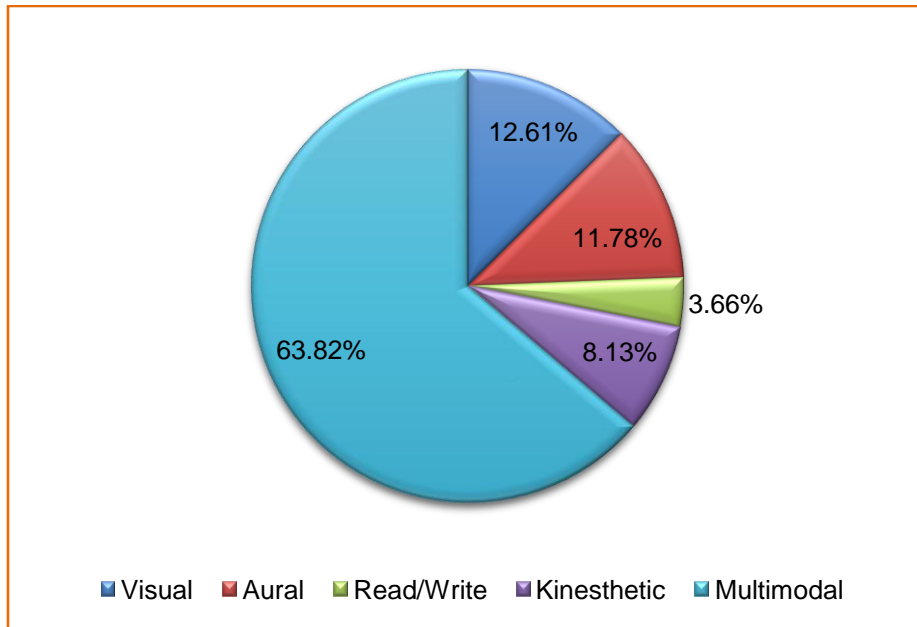
141 Demographic Profile: Out of the 300 post-graduate ODL students, who have been invited to
142 participate in the present study, 246 ODL students answered the questionnaire; therefore,
143 the response rate was 82%. Table 1 shows a comparison of learning preferences and
144 characteristics of ODL students. It is important to give an impression and describe the ODL
145 students who participated in the present study. Out of 246 participants, 213 were female,
146 which constituted 86.58%, while the remaining 33 participants were male, which represented
147 13.42%.

148 **Table 1. Comparison of ODL students learning style preferences based on**
149 **demographic profile (n=246)**

Variable	Unimodal				Multimodal	Sum
	V	A	R	K		
No. of students	31 (12.61)	29 (11.78)	9 (3.66)	20 (8.13)	157 (63.82)	246 (100)

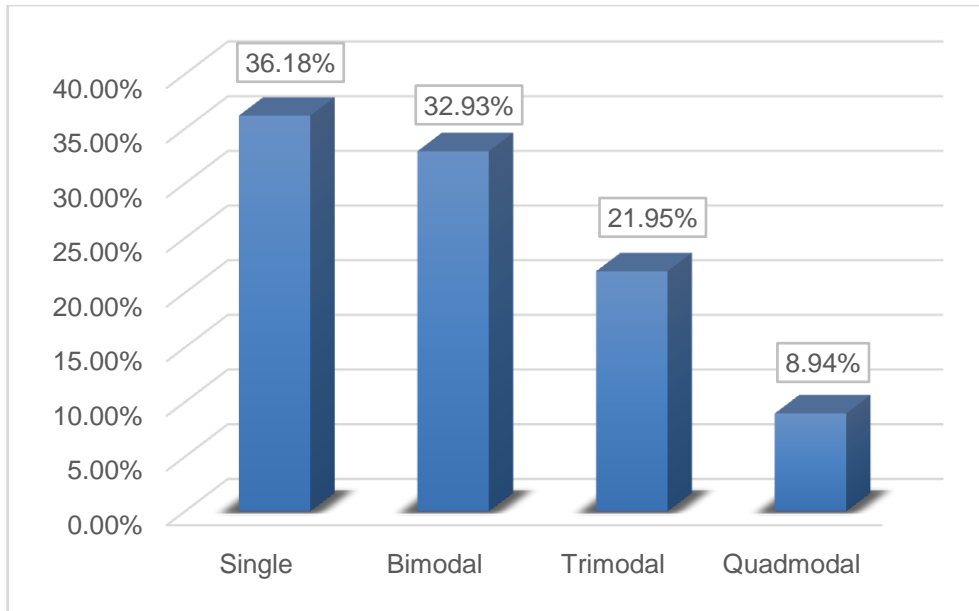
Male	4 (12.12)	2 (6.06)	1 (3.03)	2 (6.06)	24 (72.73)	33 (13.42)
Female	27 (12.67)	27 (12.67)	8 (3.76)	18 (8.46)	133 (62.44)	213 (86.58)

150 Table 1 also illustrates that 12.61%, 11.78%, 3.66 % and 8.13% of ODL students identified
 151 only the visual, aural, read/write and kinesthetic modes as their preferred learning style,
 152 respectively. That means just 36.18% of ODL students only preferred one sensory modality
 153 (visual, aural, read/write, or kinesthetic) as a learning style. There are 89 (36.18%) ODL
 154 students with single preference of learning style and 157 (63.82%) ODL students with
 155 multimodal preference of learning style.
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 158 **Figure 1. The percentages of ODL students with unimodal and multimodal learning**
 159 **preferences (n= 246)**

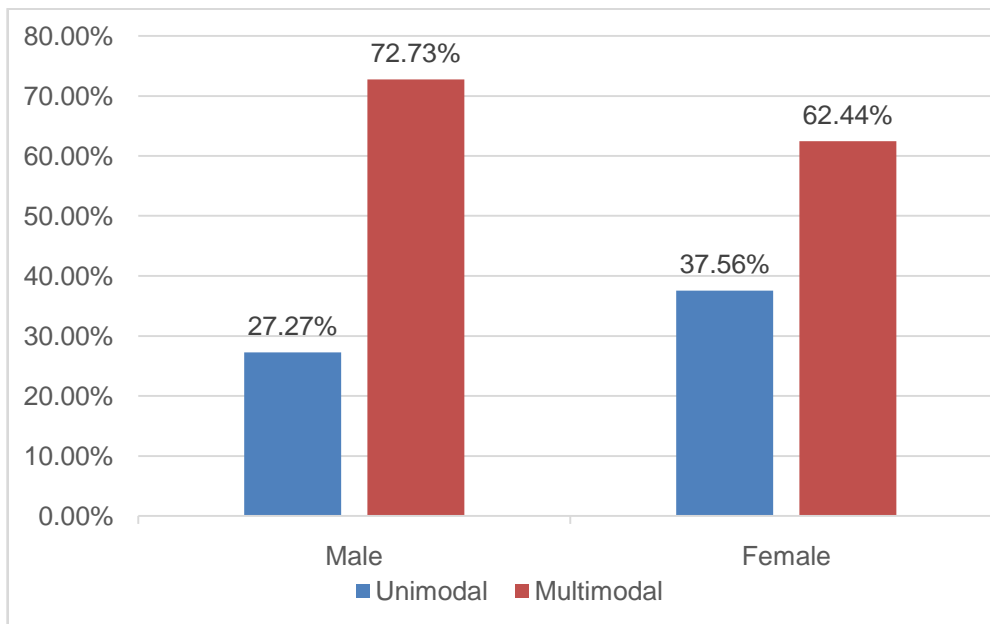
160 Figure 2 shows that 89 (36.18%), 81 (32.93%), 54 (21.95%) and 22 (8.94%) ODL students
 161 were single, bimodal, trimodal and quad modal, respectively.



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163 **Figure 2. The percentage of students who preferred two, three or four modes of the**
 164 **learning style preferences**

165 There was a statistically significant difference between male and female ODL students
 166 concerning their learning styles i.e., female students used unimodal (37.56%) more than
 167 male students (27.27%); further analysis revealed that male students used multimodal
 168 (72.73%) more than female students (62.44%).
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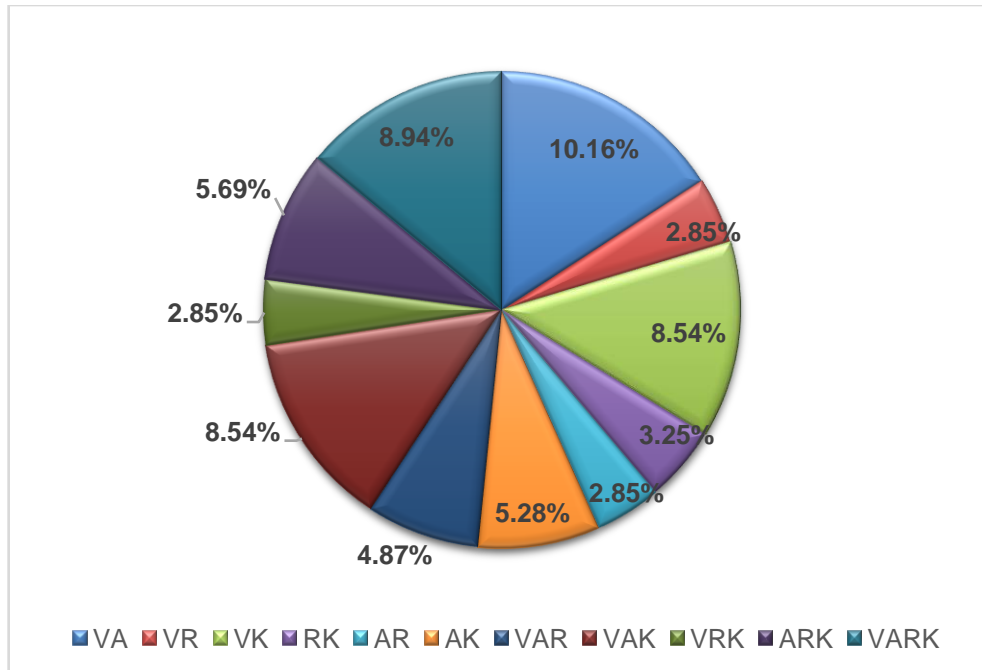
171 **Figure 3. Percentage of ODL male and female students with unimodal and multimodal**
 172 **learning preferences**

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Table 2. The Model of ODL Students based on preferred Learning Styles (n=246)

ODL Students Preference	Learning Style	Total	Percentage	Single & Multimodal Percentage
Single	V	31	12.61%	36.18%
	A	29	11.78%	
	R	9	3.66%	
	K	20	8.13%	
Bimodal	VA	25	10.16%	63.82%
	VR	7	2.85%	
	VK	21	8.54%	
	RK	8	3.25%	
	AR	7	2.85%	
	AK	13	5.28%	
Trimodal	VAR	12	4.87%	
	VAK	21	8.54%	
	VRK	7	2.85%	
	ARK	14	5.69%	
Quad modal	VARK	22	8.94%	

175 From the data in Table 2, it can be seen that the visual learning style is the most preferred
176 learning style among the ODL students. Individuals with this learning style typically grasp
177 concepts more effectively when presented with visual aids rather than verbal explanations.
178 This means for processing information through visual stimuli such as images, diagrams, and
179 spatial representations. The data also suggests that ODL students learn and understand
180 better when they can see patterns in things. The students are also excited by colourful
181 notes, and they like interesting designs and features. The second most preferred learning
182 style is aural, where information is conveyed through lectures, discussions, and retain
183 information through listening and verbal instruction. This type of individuals prefers auditory
184 information processing. Based on the data, the kinesthetic is the third most preferred
185 learning style among the ODL students. Kinesthetic learning style refers to individuals who
186 best absorb and retain information through physical activities, hands-on experiences, and
187 movement. They excel in tasks that involve physical engagement, such as laboratory
188 experiments, simulations, and interactive demonstrations. Based on Table 2, the read/write
189 learning style is the least preferred learning style among the ODL students. This learning
190 style refers to individuals who exhibit a preference for processing information through written
191 text and written communication. These learners excel in tasks that involve reading and
192 writing, such as textbooks, notes, essays, and written assignments. They have a strong
193 ability to comprehend information presented in written form and demonstrate proficiency in
194 organizing thoughts and expressing ideas through written language.



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Figure 4. Percentages of ODL students with a preferred combination of learning styles

198 Figure 4 shows that there are 22 (8.94%) ODL students who preferred quad modal learning
199 style, which means use of all components for learning i.e., visual, auditory, read/write, and
200 kinesthetic. By considering the learning style among the total number of 246 responders in
201 the present study, it is found that there are 89 (36.18%) ODL students with single preference
202 of learning style, 81 (32.93%) ODL students with bi-modal preference of learning style, and
203 54 (21.95%) ODL students with tri-modal preference of learning style. However, a further
204 analysis showed that the majority of ODL students i.e., 157 (63.82%) preferred to learn by
205 multiple sensory modalities. The multiple sensory modalities learning style encompasses
206 individuals who benefit from engaging with information through various sensory channels,
207 including visual, auditory, kinesthetic, and read/write modalities. These learners demonstrate
208 flexibility in their approach to learning, utilizing a combination of sensory experiences to
209 comprehend and retain information effectively. They thrive in environments that offer diverse
210 instructional methods, such as multimedia presentations, hands-on activities, verbal
211 discussions, and written materials. Therefore, recognizing and accommodating the multiple
212 sensory modalities learning style is crucial for ODL professionals to provide inclusive and
213 engaging learning experiences that cater to the diverse needs and preferences of ODL
214 learners.

215 The purpose of this study was to determine the learning preferences among ODL students of
216 higher education institution. It was observed that most of the ODL students favoured learning
217 by more than one information-presentation mode. The learning style of most of the ODL
218 students i.e., 63.82% is multimodal preference. This means the ODL students are competent
219 in 2 styles or more than 2 styles. Most of the ODL students are competent of VA (10.16%)
220 and VK (8.54%) learning style. The ODL student learns better from the audio-visual
221 demonstration of the teacher and practice in real setting. One of the main findings of our
222 study was that learning styles differ between male and female students. In terms of the least
223 preferred learning style, it is found that both male and female ODL students least preferred
224 read/write (R) learning style. Thus, ODL professionals should focus on understanding the

225 unique needs of each ODL student rather than stereotyping based on gender, fostering
226 inclusive learning environments that accommodate a range of learning styles regardless of
227 gender identity. In conclusion, multimodal learning style was the favoured method of
228 instruction for ODL students at our university. Among the single-mode learning styles, the
229 visual (V) style had the highest proportion, followed by the aural (A) type of learning style.

230 **7. CONCLUSION**

231 This research study has illuminated the profound impact that understanding individual
232 learning preferences can have on teaching and learning practices. In distance education
233 contexts, where face-to-face interaction is limited, understanding students' learning
234 preferences becomes even more crucial for designing engaging and impactful instructional
235 experiences. The identification of learning styles among ODL students is paramount for
236 designing effective distance learning courses. Understanding how students prefer to receive
237 and process information enables ODL professionals to tailor learning materials and
238 instructional strategies to meet diverse learning needs, thereby enhancing engagement,
239 comprehension, and overall learning outcomes. Moreover, accommodating diverse learning
240 styles in distance learning courses promotes inclusivity and equity, ensuring that all students
241 have equitable access to educational resources and opportunities for success. By
242 acknowledging and addressing individual learning preferences, the ODL professionals can
243 mitigate barriers to learning and foster a supportive learning environment conducive to
244 student success in distance learning contexts. In summary, recognizing and addressing
245 students' learning styles in distance learning environments is essential for optimizing
246 educational outcomes and promoting student success.

247 The VARK model of learning styles states that individuals have preferences for different
248 ways of receiving and processing information. Based on research result is found that
249 teaching-learning material design should be created by designing creative activities and
250 environment that goes in line with the learning abilities of the ODL students to enhance their
251 motivation and positive perception. This will enhance the learning achievement of the ODL
252 students. The information collected from the study's findings may be helpful in raising the
253 standard of instruction and learning for ODL students. As a result, it is critical that ODL
254 instructors know which learning style each of their ODL students prefers by giving them a
255 survey to complete before the new session starts. The findings of this study have effects on
256 teaching and instructional design. The results of this study have implications for instructional
257 design and teaching.

258 In this regard, it is also vital to point out that ODL practice has significantly contributed to
259 improving access for all to quality higher education in India. Apart from the VARK model
260 being used to understand the students' differences in learning preferences, this study further
261 implies that the ODL system will need to be transformed to a learner-centric approach. In
262 such a situation, ODL professionals need to understand that students have four major
263 learning styles, visual, auditory, read/write, and kinesthetic. A learning style is a manner of
264 processing information that people favour to learn or acquire information. When you are
265 helping your students, you probably choose teaching methods that suit your learning style. In
266 general, a very successful learner learns in several different ways. Overall, every student
267 also has a preference for each kind of learning style or possess each type of learning style,
268 and most of them dominate in one or multimodal styles of learning. The current research
269 study has identified the presence of different learning styles, multiple learning styles and a
270 range of major, minor, and negligible learning styles among the ODL students. Therefore, it
271 can be suggested that most of the ODL students had different types of learning styles or a
272 combination of different learning styles. Overall, the VARK model can be useful for
273 understanding the individual differences in learning preferences and can be used for

274 suggesting the teaching and learning practices to achieve the best learning results. This
275 would involve the interpretation that a variety of teaching methods and materials can be
276 used by the ODL professionals according to the learning style of different students and in
277 relation to that students can also find using their learning style which learning material or
278 activities would be most effective. In essence, the identification of students' learning styles
279 represents a foundational step towards fostering inclusive, equitable, and learner-centered
280 learning environments.

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282 We acknowledge all the ODL students who participated in the study.

283 **AUTHORS' CONTRIBUTIONS**

284 This study was carried out in collaboration between both authors. All authors read and
285 approved the final manuscript.

286 **REFERENCES**

- 289 1. Andini TM, Prastiyowati S. Learning styles and gender differences among university
290 students in Indonesia. *International Journal of English Language and Translation*
291 *Studies*. 2021; 9(3): 58–64. [http://www.eltjournal.org/archive/value9_issue3/7-9-3-
292 21.pdf](http://www.eltjournal.org/archive/value9_issue3/7-9-3-21.pdf)
- 293 2. Rasdi NN, Rusli AN. Vark Learning Style Preferences Among Malaysian University
294 Students in Open and Distance Learning (Odl). *Voice of Academia*. 2023; February.
- 295 3. Halili SH, Sulaiman S, Sulaiman H, Razak R. Exploring students' learning styles in
296 using mobile flipped classroom. *International and Multidisciplinary Journal of Social*
297 *Sciences*. 2019; 8(2): 105–125. <https://doi.org/10.17583/rimcis.2019.4070>
- 298 4. Sahoo P K, Chandra S. A Study of the Relationship between Students' Learning
299 Styles and Instructional Inputs in a Teacher Education Programme of IGNOU. *Asian*
300 *Association of Open Universities Journal*. 2014; 9(1): 17–34.
301 <https://doi.org/10.1108/AAOUJ-09-01-2014-B003>
- 302 5. Abidin MJZ, Rezaee AA, Abdullah HN, Singh KKB. Learning Styles and Overall
303 Academic Achievement in a Specific Educational System. *International Journal of*
304 *Humanities and Social Science*. 2011; 1(10): 143–152.
- 305 6. Syilvia WJ, Bansa YA. Pandemic portrayed: Learning style in online learning.
306 *BRIGHT: A Journal of English Language Teaching, Linguistics and Literature*. 2022;
307 5(1): 12-17. DOI: <https://doi.org/10.29100/bright.v5i1.2448>
- 308 7. Shenoy N, Shenoy KA, UPR. The perceptual preferences in learning among dental
309 students in clinical subjects. *J ClinDiagn Res*. 2013; 7:1683-1685.
310 <https://doi.org/10.7860/JCDR/2013/4940.3219>
- 311 8. Khongpit V, Sintanakul K, Nomphonkrang T. The VARK Learning Style of the
312 University Student in Computer Course. *International Journal of Learning and*
313 *Teaching*. 2018; 4(2): 102–106. <https://doi.org/10.18178/ijlt.4.2.102-106>
- 314 9. Rao N. Envisioning the Future of Open and Distance Learning System in India.
315 *Reimagining Indian Universities*. Association of Indian Universities, New Delhi
316 (India). 2020; 19.
- 317 10. Hosseini HM, Mehraein S. Learning styles and task preferences in online language
318 courses: Match or mismatch? *Cypriot Journal of Educational Sciences*. 2022; 17(1):
319 81–94. <https://doi.org/10.18844/cjes.v17i1.6683>
- 320 11. Nuzhat A, Salem RO, Quadri MSA, Al-Hamdan N. Learning style preferences of
321 medical students: a single-institute experience from Saudi Arabia. *International*

322 Journal of Medical Education. 2011; 2: 70–73.
323 <https://doi.org/10.5116/ijme.4e36.d31c>
324 12. Felder RM, Spurlin JE. Application, reliability, and validity of the index of learning
325 styles. Intl. J. Engr. Education. 2005; 21(1): 103-112.
326 13. Fleming N. VARK: a guide to learning styles 2007 [cited 2011 24 July 2011];
327 Available from: <http://www.varklearn.com/english/index.asp>