

LEARNING STYLE PREFERENCES OF STUDENTS IN AMERICAN UNIVERSITY OF NIGERIA, USING VARK SCORING SYSTEM

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Abstract

The validation and use of VARK scoring system in determining preferred sensory modalities for learners have evolved with time in many countries. American University of Nigeria, through the Teaching and Learning Center is poised at improving its teaching methods and practices to cater for the diverse learning styles of students. This study therefore, was to identify the learning style preferences of students using VARK questionnaire. A cross-sectional survey of all enrolled American University students totaling 1493. Standardized 16 questions VARK questionnaire was used to collect data on visual preference, aural preference, read/write preference and kinesthetic preference and analyzed using Google form and SPSS version 31. Result was presented in tables and figures with multivariate analysis of variance used to test for association between age, gender, school of study and VARK preferences at p-value 0.05. Overall preferences result showed a multimodal learning style among AUN students. A little over two-third of the population of respondents fit into this multimodal preferences group. There were levels in VARK preferences according to gender, age and course of study with most students gravitating towards multimodalities of learning preferences particularly in aural and kinesthetic styles. Gender, age and school of study of respondents were not significantly associated with learning style preferences ($p < 0.05$). However, increasing age (> 22 years) has an affinity towards adopting higher limits of learning style preferences by learners. The dominance of multimodal preferences among AUN students, confirms that an integrated approach, with multisensory pedagogy is best suited for learners. The choice of VARK in American University of Nigeria depict the peculiarity of students learning preferences. Researchers recommend adoption of multimodal approach that customizes pedagogy by discipline, while diversifying assessments to engage all VARK modes.

Key words: VARK, Learning style preferences, Students, American University of Nigeria

Introduction

The concept of learning styles started in 1970 and has dynamically changed since then. These changes with time, are influenced by the environment of learners, the learning context, personal experiences of learners and teaching methods.¹ The younger generation of learners are influenced by emerging innovations of our time compared to older generation of learners. Particularly, evolving technologies in teaching and learning over the years, have impacted on students learning style preferences.² Psychologists argue that learning is often a mix of learning preferences and that there is no exclusive learning style.³ Currently, there are many theories of learning styles existing; each with model for evaluating learning preferences and classifying people into different sensory or cognitive groups of learners.⁴

Among these models, there is no single best, however VARK model and Felder-Silverman model have been used widely and effectively in evaluating learning style preferences. The VARK model developed by Neil Fleming in 1987 focuses on sensory modalities for evaluation of learning style preferences.⁵ The domains of preferences include: visual preference: learning best through diagrams, charts and visual aids; aural preference: learning best through listening and auditory inputs; read/write preference: learning best through written words and information; kinesthetic preference: learning best through hands-on experience and physical activity. There can be a combination of any of the four VARK sensory modalities in learning styles making it bimodal, trimodal or multimodal preferences.

Learners show different combinations of learning styles. While some prefer aural and visual styles, others might prefer reading and kinesthetic styles. Several studies using VARK in the past have shown that learners preferences are better with experiencing many sensory modalities at a time. For example, undergraduate learners and those with increased educational levels, exhibit between tri-modal and multi-modal preferences.⁶ It emphasized that despite each learner's difference on the preferred learning style, trimodal and multimodal learning styles trumped unimodal and bimodal learning styles. It has also been argued that gender, age and course of study play a role in determining learning style preferences of learners.

A multi-collegiate Malaysian study among students showed that course of study and gender have strong correlation with learning style preferences.⁷ It could be debated that there might be differences in the style of preference with respect to age as well, however, it failed to prove any relationship between age of the learner and the learning style preference. While that in Malaysia supports gender as a determinant in learning preference, other studies disprove any correlation between gender and learning style preference.^{8,9} In Nigeria, studies on learning style preferences cuts across different spheres of learners. Most research however, indicate that different learning style preferences improve learning outcome.⁹⁻¹²

Researchers over the years, have debated on the veracity of learning style preferences as a myth without validation, based on the unreliable and inappropriate research design methods of existing studies. They argue that there is no single acceptable learning style preference and that evidence does not exist to support that learning on a particular style, does show improved learner performance.^{3,4,13-17} However, some other research findings think otherwise and have espoused adopting different learning style preferences as key to better learning and performance.^{1,2,6,7,18-22}

There is no available record of previous study using VARK scoring system on American University Student Community. In addition, The Teaching and Learning Center is poised at improving its teaching methods and practices to cater for the diverse learning styles of students. This study therefore, despite all the evidences for and against, sought to ascertain the true nature of learners' style preferences in American University of Nigeria as well as the association between these preferences and age, gender and school of study.

Methodology

Study design and Study area

This was a school-based cross-sectional survey in American University of Nigeria. The University is located in serene Yola, Adamawa State Capital, North-East Nigeria. It is one of the private Universities established in Nigeria with license to operate in 2003. In spring 2005/fall 2006, 124 first set of students were admitted for studies. In her 20th anniversary of commencing academic activities, the University which prides itself as a developmental University, has grown to a student population of over 1493.²³

Study population

All currently enrolled students (undergraduates, graduate and doctoral) of American University of Nigeria in the Fall, 2025 semester totaling 1493, were used for the study.

Data collection method

Standardized structured VARK scoring questionnaire version 8.02²⁴ was used to collect data on the learning style preferences of students in American University of Nigeria. Students received online- through their University email accounts, a google form link containing the 16 VARK questionnaire ranging from visual preference, aural preference, read/write preference, to kinesthetic preference. Each of the 16 questions has four multiple choice answers of VARK preferences and respondents picked one or more options in each question as preference (s). Out of the 1493 students enrolled for Fall, 2025 Semester, 306 respondents completed the survey.

Data analysis

Quantitative data analysis was done using google forms and SPSS version 31. Data cleaning steps involved each item coded for V, A, R, K modalities. All multi-marked responses were credited to chosen modalities with each learner's total for every modality, normalized by total responses. Different learning style preferences among respondents were analyzed and interpreted. Learners were classified as unimodal if one modality exceeded others by ≥ 2 points; otherwise they were classified as multimodal. Percentages and scores were tabulated for the total of 306 respondents according to the scores in 16 questions VARK. Cronbach's α was used to confirm internal consistency (0.81). The result of findings was presented in tables and figures with multivariate analysis of variance used to test for association between age, gender, school of study and VARK preferences at p-value 0.05.

Ethical consideration

Ethical Approval was granted by the American University of Nigeria's Institutional Review Board (IRB). Students who participated in the study gave informed consent with confidentiality assured as no personal information was included in the survey.

Results

As shown in Figure 1, 182 (59.5%) respondents who participated in the survey, identified as females, while 124 (40.5%) were males.

Figure 2 indicates that 73(23.9%) respondents were 22 years of age and above, 91 (29.7%) were 19 to 21 years while 142 (46.4%) were 18years and below.

Figure 3 illustrates the various schools of enrollment by respondents showing that 86 (28.1%) were from School of Law, 61 (19.9%) were from Arts and Science and 60 (19.6%) from School of Information Technology and Computing. It also further revealed that 34 (11.1%) respondents were from School of Basic Medical and Health Sciences, 31 (10.1%) from School of Engineering, 26 (8.5%) from School of Business and Entrepreneurship and 8(2.6%) from Graduate School.

Figure 4 shows VARK preferences by gender indicating the preponderance of both aural and kinesthetic learning styles among respondents.

Figure 5 illustrates VARK preferences by age showing that both aural and kinesthetic learning styles were preferred among respondents.

Figure 6 highlights VARK preferences by school of study indicating the choices of both aural and kinesthetic learning styles among respondents, except for school of graduate studies- with visual and kinesthetic styles as preferences among respondents.

Table 1a shows that respondents with multimodal preferences are 207 (67.6%), while respondents with visual, aural, read/write and kinesthetic unimodal preferences are 22 (7.2%), 14 (4.6%), 19 (6.2%) and 44 (14.4%) respectively. Table 1b further highlighted the highest mean scores of VARK preferences to be aural and kinesthetic preferences among respondents.

Table 2 illustrates the dominant learning styles by school of study. It shows that Schools of Law and Arts and Science have preferences for read and aural styles, while Engineering and Basic Medical and Health Sciences have preferences for Kinesthetic and visual styles. However, School of Information and Computing has exclusive preference for only Kinesthetic style.

Table 3 demonstrated no statistically significant association ($P\text{-value} < 0.05$) among gender, age, school of study of the respondents in relation to their VARK preferences.

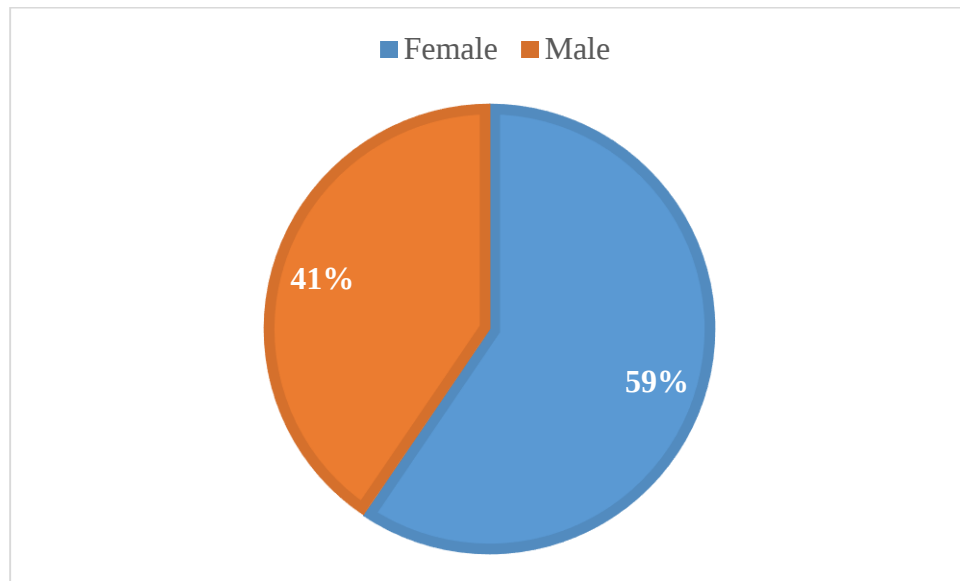


Figure 1: Gender of the respondents

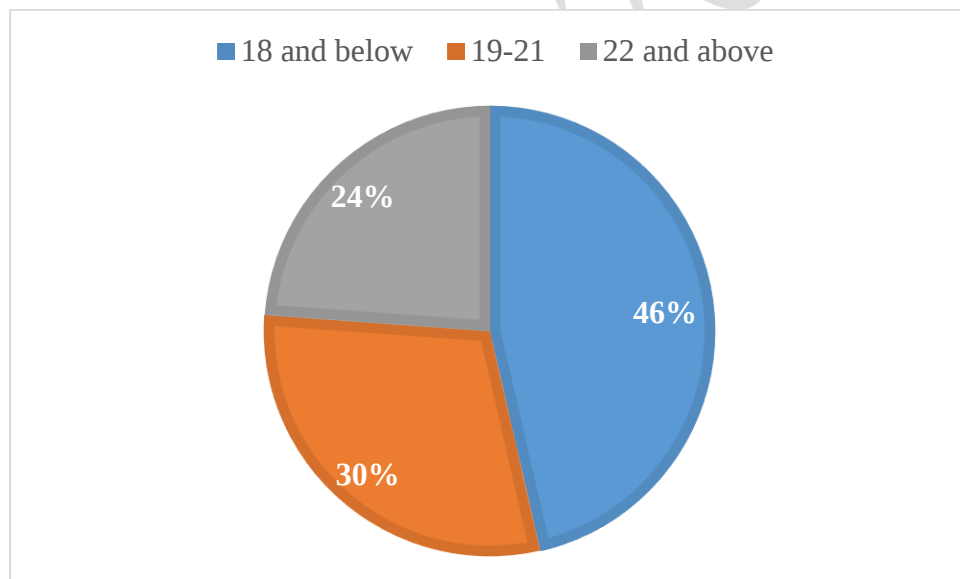


Figure 2: Age range of the respondents (years)

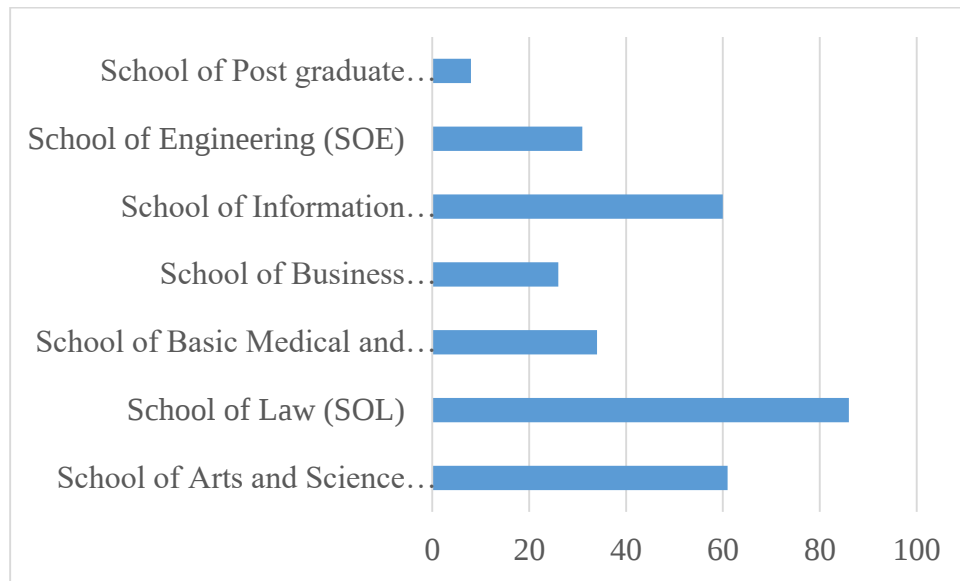


Figure 3: Schools of enrollment by the respondents

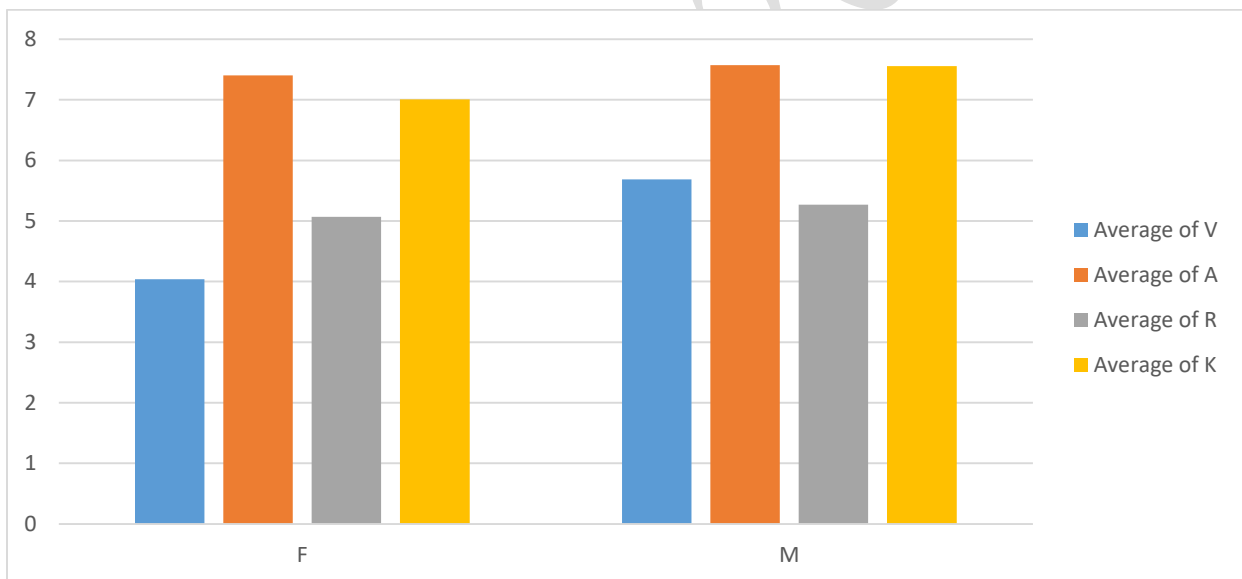


Figure 4: VARK preferences by Gender

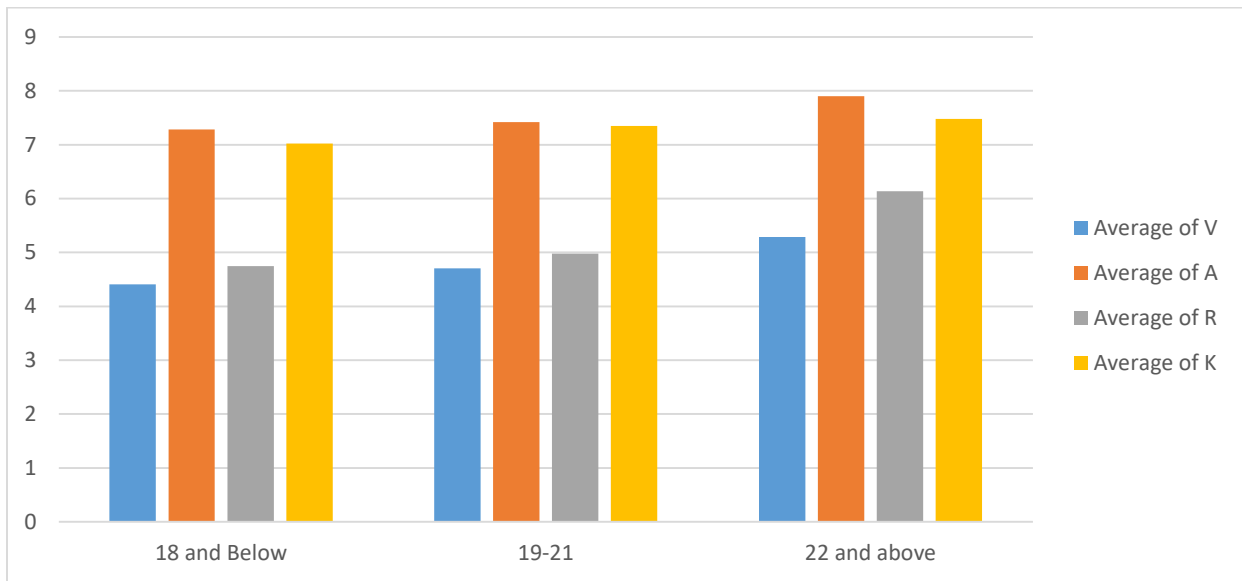


Figure 5: VARK preferences by Age

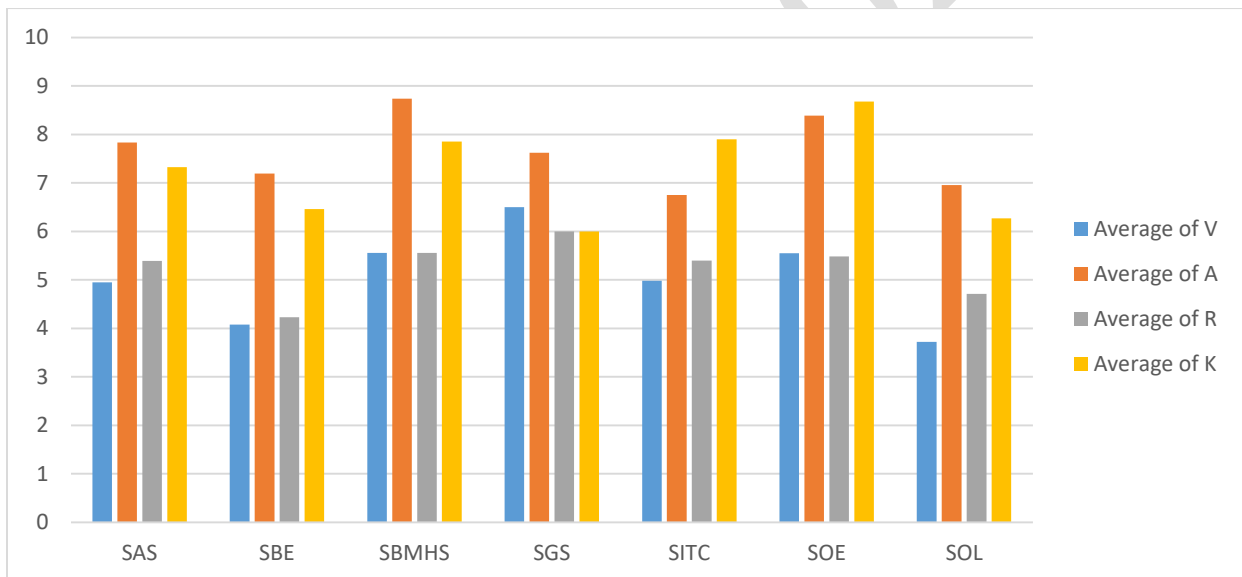


Figure 6: VARK preferences by School of study

Table 1a: Learning style preferences of AUN Students

Preference	n	%
Visual (V)	22	7.2
Aural (A)	14	4.6
Read/Write (R)	19	6.2

Preference	n	%
Kinesthetic (K)	44	14.4
Multimodal (MM)	207	67.6

Table 1b: Mean VARK scores of Learning style preferences of AUN Students

	N Statistic	Minimum Statistic	Maximum Statistic	Mean Statistic	Std. Error	Std. Deviation Statistic	Variance Statistic
Total_V	306	.00	15.00	4.7059	.19872	3.47616	12.084
Total_A	306	.00	15.00	7.4706	.20888	3.65398	13.352
Total_R	306	.00	15.00	5.1471	.21169	3.70307	13.713
Total_K	306	.00	15.00	7.2288	.22621	3.95714	15.659
Valid N (listwise)	306						

Table 2: Dominant Learning styles by school of study

School	Dominant Modalities
Law (SOL)	Read/Write + Aural
Arts & Sciences (SAS)	Aural + Read/Write
Engineering (SOE)	Kinesthetic + Visual
IT & Computing (SITC)	Kinesthetic
Health (SBMHS)	Kinesthetic + Visual

Table 3: Test of association between gender, age, school of study and VARK

Source	Dependent Variable	Sig.
Corrected Model	Total_V	.001
	Total_A	.029
	Total_R	.535
	Total_K	.022
Intercept	Total_V	<.001
	Total_A	<.001
	Total_R	<.001
	Total_K	<.001
Gender	Total_V	.005
	Total_A	.121
	Total_R	.293
	Total_K	.483
Age	Total_V	.617
	Total_A	.864
	Total_R	.649
	Total_K	.682
School	Total_V	.235
	Total_A	.393
	Total_R	.535
	Total_K	.054

Discussion

The use of VARK scoring system globally in the determination of learning style preferences of learners has been a subject of controversy over the years. While some researchers and educational psychologists dispute the usefulness and application of the learning style preferences in improving learners' outcome, others think otherwise. Despite the arguments for and against, this study set out to elucidate the peculiarity of learning style preferences among learners in its location.

The study revealed that majority of the respondents in American University of Nigeria, at the time of the study had multimodal preferences of learning styles with aural and kinesthetic style as most preferred. This depicts a learning style cutting across all preferences among the University Community of learners. It shows that two-thirds of the respondents preferred to learn best through a combination of: diagrams, charts and visual aids; listening and auditory inputs; written words and information; and hands-on experience and physical activity. Earlier studies conducted^{1,2,6,7,18-22} indicated that most learners gravitated towards trimodal or multimodal learning style preferences. Other evidence in addition, highlighted that multimodal learning style preferences improved learning outcome.⁹⁻¹² The findings among respondents in American University in this study, further validates these evidence. It is important to note that one preference over the other,

should not be perceived as either strength or weakness. Sometimes, there may be no particular preference; as all scores can be even, which shows multiple preferences of respondents.

Learning preferences of students in American University of Nigeria vary according to schools of study. Most schools of respondents indicated multimodalities of learning styles. Schools of Law and Arts and Science respondents were also noted to prefer read/write as well as aural style as the modalities for learning. The dominant modalities for these two schools show that respondents are inclined to listening and auditory inputs as well as written words and information. This finding is not surprising, particularly considering the pedagogy of teaching and learning in the disciplines mentioned. Also of note are the preferences of School of Engineering, Basic medical and Health Sciences as well as Information Technology and Computing with kinesthetic and visual styles as dominant modalities. Respondents here prefer learning better with diagrams, charts and other visual aids and particularly through hands-on experience and demonstrations. These finding are supported by an earlier multi-collegiate study which revealed an association between course of study and learning style preferences.⁷

The study did not indicate any association between gender and learning style preferences of students. Female preferences of learning style do not differ from that of male preference. This agrees with the report earlier^{8,9} that gender is not a determinant of the choice of learning styles by learners. Moreover, it would not be expedient aggregating learners into males and females for the purpose of learning style preferences, while teaching. However, though schools of study did not reveal an association with learning style preferences of respondents, studying in the Sciences like Engineering and IT favors a style of visuals and demonstrations, while studying in the humanities favors auditory, written words and information styles. Learning styles with age on the other hand, did not show any significant association with VARK except that respondents with age 22 and above, can be described as having an increased affinity to all the learning styles compared to other respondents in lower ages. This could mean that the higher the age of respondents, the more their engagement with text-based and conceptual materials. It is also possibly due to growing academic literacy and exposure to more reading and intensive coursework. These findings align with developmental patterns described by Samarakoon et al²⁵ and thus reinforces the value of “scaffolding textual learning strategies” for older university students.

Conclusion

Learning style preferences of learners are mostly multimodal with levels in particular VARK preference varying across different gender, ages and schools/courses of study. The dominance of multimodal preferences among AUN students, confirms that an integrated approach, with multisensory pedagogy is best suited for learners. Gender, age and school of study of learners do not determine the choice of a learning style preference, however increasing age has an affinity towards adopting higher learning style preferences by learners-implicating maturation fosters academic literacy. This research will guide policy makers in Education, University educators and researchers in recognizing the importance and application of multimodal approach of learning style preferences, in teaching and learning, towards improving learning outcome.

Moreover, the researchers advocate adoption of multimodal teaching which blends visuals, discussion, text, and practice. They also emphasize on customizing pedagogy by discipline (e.g., experiential learning in engineering and health sciences), while diversifying assessments to engage all VARK modes. Faculty training on inclusive multimodal design is also encouraged, with a proposition for a more robust studies using VARK in many educational institutions in Nigeria to further validate and explore variations in learning style preferences of learners.

Conflict of interest

The authors declare no conflict of interest.

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