Original Article

Association between learning style preferences and choices of teaching method among Iranian faculty members: A cross-sectional online survey

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Abstract

Background & Objective: Aligning faculty members' learning styles with their teaching approaches is a complicated topic in education. Understanding these inclinations can help enhance pedagogical practices and build a more inclusive learning environment. Thus, this study examined the relationship between learning style preferences and teaching technique choices among Iranian faculty members.

Material & Methods: From May to July 2022, a cross-sectional online survey was conducted among faculty members at Iranian medical universities via the Porsline website. Virtual snowball sampling was used to recruit 526 individuals. The VARK questionnaire was translated into Persian and showed excellent reliability, with a Cronbach's alpha of 0.94. The final data collection tools included the translated VARK questionnaire, self-assessment questions about teaching methods, university resources, and digital media center equipment. Analytical methods included descriptive statistics, logistic regression analysis, and chi-square testing for data evaluation.

Results: The survey found that clinical teachers preferred reading and writing (54%), whereas fundamental science educators preferred visual-auditory and reading-writing. The effect of gender, field of study, learning style, age, and professional academic factors on the dependent variable, teaching method, was investigated using chi-square tests and logistic regression. The findings revealed that while there was no significant relationship between the variable gender and teaching method, significant associations were found with the variables field of study, learning style, age, and professional academic. Notably, it was observed that the effect size of field of study, age, and professional academic on teaching method is small, while for learning style, it is medium in magnitude.

Conclusion: The study uncovers a significant correlation between learning styles and teaching methods, suggesting that their learning backgrounds may shape teachers' teaching methods.

Keywords: learning styles, VARK, teachers, teaching methods

Introduction

One of education's most essential and challenging concerns is the alignment or misalignment of faculty members' learning styles with their preferred teaching methods (1). Individual processing styles, such as visual, auditory, or kinesthetic, are included in these preferences (2). In recent times, there has been a lot of focus on understanding the distinct learning style preferences of teachers and how it influences their teaching methodologies (3, 4). This research has the potential to lead to specialized seminars being organized across universities and educational institutions all over the world (5, 6).

Quan-Baffour et al. say that it is critical to recognize the significance of this issue, as it can significantly improve

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educational techniques and build a more pleasant learning environment for teachers and students. Understanding the various learning styles instructors prefer is extremely important for various reasons. With this understanding, educators can modify their teaching approaches to meet their students' needs and preferences better, thereby increasing their instruction's efficacy and appeal (7). Furthermore, recognizing and accommodating these preferences can lead to a more inclusive and supportive learning environment that promotes student achievement and contentment (8). Furthermore, investigating learning style preferences can make significant contributions to educational research by showing how cultural factors influence instructional techniques and student involvement.

Previous research on learning style preferences and teaching methods has delved into the complex task of identifying prevalent learning styles among students (9, 10), investigating the effects of aligning or misaligning teaching strategies with individualized learning styles, and examining the potential implications for instructional design and pedagogy (11). Despite a lot of interest in this field, the research on learning styles hasn't yielded consistent or conclusive results. This could be due to several factors, including the absence of a universally accepted definition and measurement system for learning styles, and the varied outcomes and settings in education. Academic accomplishment, a multidimensional construct that includes grades, test scores, retention rates, and graduation rates, is a primary focus of educational research (12, 13). Researchers such as Atlasi et al. in Iran, Kannan et al. in Malaysia, Schneider et al. in Germany, and Kovtun et al. in Russia have investigated the complexities of learning style preferences and their impact on academic achievement in a variety of educational settings, including elementary school, high school, college, and online courses. While some studies have found beneficial correlations between distinct learning styles and academic ability, others have found no significant associations or negative relationships (16, 17). Furthermore, Honicke et al. and Ning contend that gender differences, age variations, cultural influences, motivation levels, self-regulation abilities, and instructor feedback may moderate or mediate the relationship between learning style preferences and academic achievement (18, 19).

It is commonly known that teachers play an essential role as role models for their pupils, and students frequently gravitate towards educators who share their learning patterns (20–23). The learning preferences that students have can have a significant impact on their academic performance, especially if they pursue a career in teaching. However, it is unclear whether these preferences affect their teaching methods. The purpose of this research study was to investigate the possible relationship between teachers' learning preferences and their teaching approaches, as well as the correlation between educational resources and teaching methods. The ultimate goal was to identify any significant connections in this area of study.

Material & Methods

Design and setting(s)

From 5 May to 28 July 2022, a cross-sectional online survey was carried out to identify the preferred learning styles of health professionals and primary science teachers at Iranian Medical Sciences University. The final goal was to find a link between these preferences and their instructional approaches. We conducted the study online to address challenges such as teachers being situated in different locations, limited availability for face-to-face meetings, and the need for participant anonymity. The survey was conducted using the Porsline web platform (https://porsline.ir/). Figure 1 presents an overview of the approach used to carry out this investigation.

Participants and sampling

The study's target population was comprised of all faculty members of universities in the field of Iranian medical sciences. The scope of this study encompasses health professional teachers involved in educating students and the health system. These individuals specialize in various fields within the health profession, such as medicine, dentistry, nursing, midwifery, surgery, and operating room (clinical teachers). Subsequently, all other teachers fall into the essential science category. The data collected from the Iranian Scientometrics Information Database (ISID) - Iran Ministry of Health indicated that there were 20, 276 faculty members at these universities. The research sample size was determined using G-Power software, which specified the statistical test type and pertinent parameters to generate a minimal sample size for significant results. Because this study used logistic regression and chi-square methods for inferential statistics, and logistic regression requires a larger sample size for significance, a logistic regression assumption was included in the pre-test, which was run using G-Power software. An odds ratio of 1.3, a type I error rate of 0.05, a significance level of

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0:95, and a test power of 0:80 determined that at least 568 individuals were needed to obtain statistically significant findings.

To initiate this research, invitations were extended to faculty members of Medical Sciences Universities in Iran to participate in a virtual snowball sampling method (24, 25). This sample approach was adopted after considerable study due to the difficulties accessing all faculty members and the continued issues posed by the COVID-19 epidemic. This procedure was performed in the following manner. When recruiting faculty members, we started by identifying a particular cohort of faculty from several universities. We then emailed them an invitation link to participate in our research. Furthermore, we suggested that they spread this link to other faculty members at their particular colleges via platforms such as Telegram, WhatsApp, and email. The invitation not only provided details regarding the purposes and characteristics of the study but also ensured (**Figure 1**).

that informed consent was acquired before conducting the survey.

The inclusion criteria for this study involved: 1) Selecting Iranian faculty members from a wide range of academic disciplines willing to participate in an online survey, 2) having internet access and 3) possessing at least one year of teaching experience.

The exclusion criteria for this study were: 1) Not being an Iranian or not teaching in Iran, 2) not having access to the internet or refusing to participate in online questionnaires, and 3) having less than one year of teaching experience or being retired. Initially, the survey was distributed to 563 faculty members. However, after applying the exclusion criteria, 37 individuals were disqualified from further investigation. This group consisted of people who were not affiliated with the University of Medical Sciences, lacked internet access or proficiency in the Persian language, and were unable to complete the survey form

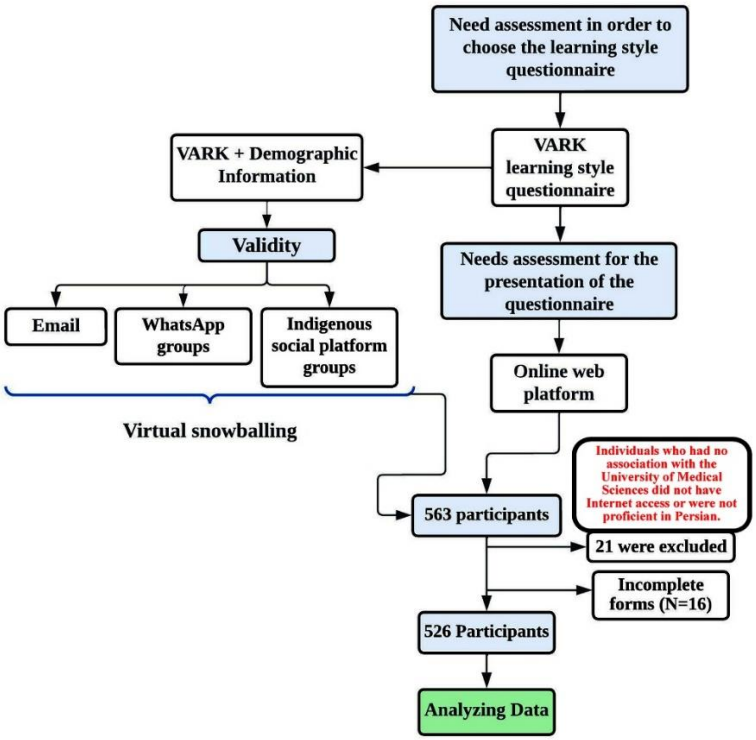

Figure 1. Study procedures and requirements

Tools/Instruments

Two questionnaires were employed in this research: one gathered demographic information, and the other assessed VARK learning styles. The data collection method section details the validity and reliability of these questionnaires.

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Data collection methods

In order to investigate the potential impact of teachers' learning style preferences on their selection of teaching methods, an online survey was carried out in Iran that maintained respondent anonymity. The questionnaire encompassed three distinct sections:

1) The initial segment of the protocol delineated the aims and commencement of the investigation, followed by a document for obtaining informed consent. The sheet containing information for participants conveyed that their involvement in the study was voluntary and would not impact their evaluation or performance as teachers. Demographic details concerning faculty members involved age categories (25-30, 31–40, 41–50, over 51), gender, academic discipline, educational attainment (bachelor's degree, master's degree, doctoral degree), professional status (assistant professorship, associate professorship, full professorship) years of teaching experience at university level and type of institution they were affiliated with. The validity and reliability of these questions were thoroughly evaluated by the same team that determined the reliability of the Visual, Auditory, Reading, Writing, and Kinesthetic (VARK) questionnaire. Specific criteria were developed to evaluate participation eligibility, including affiliation with Medical Sciences Universities and consent to participate. Teachers employed at tuition centers outside of universities and those with less than three years of teaching experience did not meet these inclusion criteria. In order to ensure confidentiality and protect anonymity during analysis processes, all participant names, along with institutional affiliations, remained undisclosed.

2) Following many discussions and an analysis of various learning styles, the research team used the VARK learning styles questionnaire in this study. The academic literature has a variety of findings about the trustworthiness and consistency of the VARK learning style questionnaire in diverse worldwide contexts. Wong et al. discovered that the VARK questionnaire was highly reliable among Chinese nursing undergraduates, with reliability values ranging from 0.69 to 0.84 for the VARK subscales. Ghasemi et al. discovered a link between VARK and Kolb learning styles among Iranian students, implying some validity (27). Fitkov-Norris et al. employed Rasch analysis to determine that the VARK questionnaire had internal validity, but additional testing was required to establish its invariability across different user groups (28).

The questionnaire was created using a web-based platform for easy access and administration. Fleming and Mills developed the VARK questionnaire in 1992, which consists of 16 questions designed to identify four distinct learning modalities: visual, auditory, reading/writing, and kinesthetic (29). Each question is intended to replicate a specific learning scenario in which respondents must choose two or more options that best reflect their preferred method(s) of knowledge acquisition. In order to examine the distribution of VARK preferences, the SPSS-26 software was utilized. The learning preferences were categorized into several groups: unimodal (V, A, R, or K), bimodal (VA, VR, AR, VK, AK, and RK), trimodal (VAR, ARK, VRK, and VAK), or quadmodal (VARK). To confirm the credibility of our findings, two multilingual specialists translated the questionnaire from English to Persian using a forward-backward procedure. Initially, a Persian translator completed the translation, which another specialist back-translated into English (30).

In addition, four faculty members from the Faculty of Education and Psychology and domain experts assessed both versions before presenting the final version in Persian.

The questionnaire was further refined using feedback from 30 teachers who did not engage in the study; their contributions aided in identifying imprecise and conceptually unclear items. Several previously ambiguous or unclear questions were updated to increase clarity and accuracy. Ten teachers then validated the changes using a 16-item multiple-choice questionnaire. Each question targeted a specific learning type and offered priority options.

The options included visual style (option ‘A’), reading and writing style (option ‘B’), auditory style (option ‘C’), and kinesthetic style (option ‘D’). Subsequently, teachers ranked these options based on their preferences from one to four. By summing up the priorities selected by each teacher for each learning style option, total scores were calculated for options A through D, respectively. Individual scores obtained through this process were compared to determine the preference order among these styles. Moreover, when we evaluated its internal consistency reliability using Cronbach's alpha coefficient, we obtained an impressive score of 0.94. For this section, we referred to Teaching at Its Best: A Research-Based Resource for College Instructors (5th Edition) by Wiley (31) to formulate the questions. As a result, we included the following four questions in the final inquiry:

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- According to your personal experience, which learning style do you identify with the most in terms of your preferred approach to acquiring knowledge?

A) Reading and writing

B) Auditory

C) Visual

D) Kinesthetic

- Which teaching methods do you employ during your teaching sessions?

A) Lecture

B) Group discussion

C) Role-play

D) Gamification

E) Flip the classroom

F) Project-based learning

G) Problem-based learning (PBL)

H) Case-based learning

- Is your university equipped with the essential resources, such as facilities, software, and hardware, to facilitate the provision of higher education? (yes/no)

- Have you utilized your university's digital media center equipment for teaching and learning objectives on multiple occasions? (yes/no)

Data analysis We used descriptive statistics to examine the survey data collected from 526 participants. The analysis was carried out with statistical tools such as IBM SPSS version 26, G-power, and Microsoft Excel 2019. We also utilized logistic regression and chi-square tests to compare teaching approaches based on demographic variables such as age, gender, academic field of study, degree level earned, years of teaching experience, and university type. All analyses in this study have a significance level of $p < 0.05$.

Results

The impact of gender, field of study, learning style, age, and professional academic variables on the dependent variable, 'Teaching Method' was explored using chi-square tests and logistic regression. The findings revealed that while there was no significant relationship between the variable gender and teaching method, significant associations were found with the variables field of study, learning style, age, and professional academic. Notably, it was observed that the effect size of field of study, age, and professional academic on teaching method is small, while for learning style, it is medium in magnitude. **Table 1** presents the findings of both logistic regression and chi-square analysis.

Table 1. Results of conducting logistic regression and performing a chi-square test

	Teaching Method				
	Chi-Square Tests			Symmetric Measures	
	Pearson Chi-Square			Nominal by Nominal (Cramer's V)	
	Value	Df	Sig	Value	Approx. Sig.
Gender	4.649	7	0.703	0.094	0.703
Field	14.794	7	0.039	0.168	0.039
Learning Style	381.693	21	0.001	0.492	0.001
Age	102.837	21	0.001	0.255	0.001
Professional academic	89.788	21	0.001	0.239	0.001

Note 1: Logistic regression was used to model the relationship between teaching method and a binary outcome variable.
Note 2: Chi-square tests were conducted to assess the association between teaching method and various categorical demographic variables.
Note 3: Symmetric measures (Pearson's Chi-Square and Cramer's V) were used to evaluate the strength of these associations.
Abbreviations: Df, degrees of freedom; Sig., significance level (p-value); Approx. Sig., approximate significance (reported for some chi-square tests); Value, chi-square statistic or Cramer's V value

Self-reporting of learning style

About 70% of participants preferred visual learning styles, with the majority being assistant professors. Approximately 17% preferred auditory learning styles, most of which were taught in clinical sciences. A small percentage (8%) favored reading and writing as their learning styles; they were primarily professors over the age of 51 teaching in clinical settings. Based on the research findings, 5% of participants favored kinesthetic learning, with most holding master's degrees in their late

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20s or early 30s. The details of these learning styles are illustrated in **Figure 2**.

°*VARK questionnaire: Determining learning styles*

This study showed that most clinical teachers (54%) preferred a reading and writing learning style, while visual and auditory learning styles were common among primary science teachers. Assistant professors in the clinical group preferred auditory learning; no one had an Auditory-Kinetic learning style. Around 25 faculty members, aged 25 to 30, preferred kinesthetic learning. The bulk of them had master's degrees and worked as educators.

Table 2 shows the distribution of learning styles among faculty members who are clinical teachers, and **Table 3** shows the distribution of learning styles among basic science teachers

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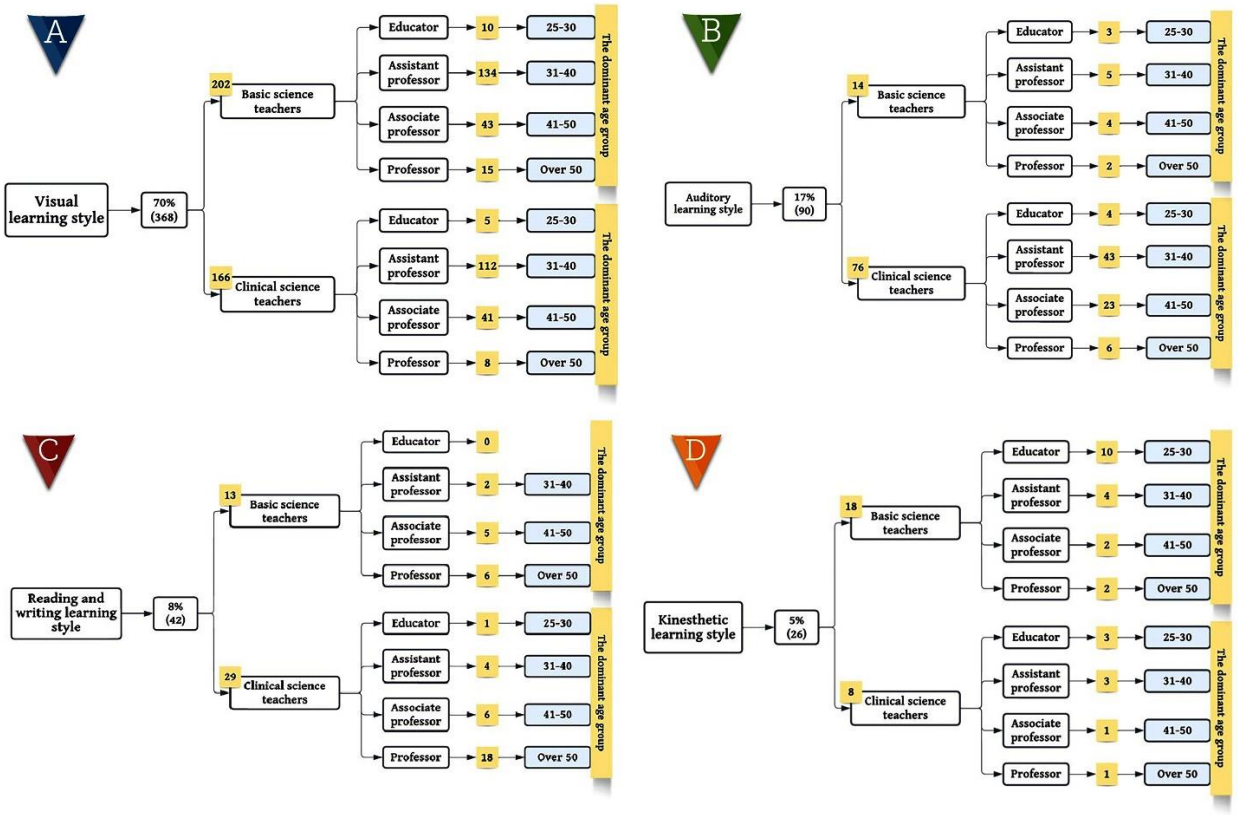

Figure 2. Self-report of the learning styles of clinical and basic science teachers

Learning styles and choosing a teaching method

The study found that most teachers preferred a lecture method with a reading and writing style, followed by visual and auditory learning styles—the preferred learning style was reading, viewing, and analyzing. Those who chose group discussion preferred the auditory learning technique, followed by the visual learning style. Teachers who preferred role-play teaching had a tendency towards visual or kinaesthetic learning styles, resulting in a preference for VK learning style. Gamification method users had a nearly equal preference for kinetic and visual learning styles, leading to a predominant KV learning style. Teachers who utilized the flip classroom method mostly had a visual learning style, with auditory being the second most common, which is classified as VA learning style. **Figure 3** (part A) illustrates the distribution of these teaching methods according to participants' specific styles.

Discipline differences in the choice of teaching methods and learning styles

The study showed that clinical teachers tend towards reading and writing learning styles, while primary science teachers prefer visual learning. Clinical teachers who prefer group discussions showed an auditory-visual learning style. In contrast, primary science teachers who

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prefer kinetic and visual learning styles often opt to use gamification as their teaching method. Both groups use problem-based learning methods similarly. However, clinical teachers tend to utilize case-based learning more frequently to cater to their visual tendencies, as depicted in **Figure 3** and **Appendix 1** and **Appendix 2**.

Table 2. The classification of clinical teachers group based on the variables studied

Variable	Sub variable	Frequency	Percent (%)
Sex	Male	130	46.6
	Female	149	53.4
Age (years)	25-30	40	14.3
	31-40	117	41.9
	41-50	101	36.2
	Over 50	21	7.5
Professional Academic	Assistance professor	121	43.4
	Associate professor	96	34.4
	Professor	20	7.2
	Educator	42	15.1
Learning Style	Visual	146	52.3
	Auditory	52	18.6
	Reading and Writing	70	25.1
	Kinesthetic	11	3.9
Teaching Method	Lecture	119	42.7
	Group discussion	40	14.3
	Roleplay	14	5
	Gamification	16	5.7
	Flip classroom	48	17.2
	Project-based learning	18	6.5
	Problem-based learning	13	4.7
	Case-based learning	11	3.9

Gender differences in the choice of teaching methods and learning styles

Clinical teachers

According to the study, learning preferences in the clinical sciences are primarily based on reading-writing and visual learning styles. However, male and female teachers exhibit different learning styles among clinical teachers. Males tend to prefer an auditory learning style, while females have an RVA Learning style. Males are more likely to participate in group conversations, although both genders use AV learning approaches. Males favor role-playing teaching methods, known as VK, although gamification teaching methods are more popular among males with visual learning styles. Females, on the other hand, typically have KV learning styles. Females with VA learning styles are more likely to use the flip classroom method, although guys with visual learning styles do as well. Problem-based learning

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is more popular among females who favor visual learning methods.

Basic science teachers

Female teachers prefer visual learning and reading and writing as their preferred learning styles, while male teachers prefer audio-visual representation. Both genders use group discussions for effective learning, and both groups have similar preferences for role-playing. Both sexes support gamification as a teaching method, although males are likelier to use the flipped classroom format. Female teachers primarily use problem-based learning methods, whereas project-based and case-based approaches heavily rely on visual learning styles. However, Case-Based Learning (CBL) is most popular among male teachers. The distribution of learning styles based on teaching method and gender is shown in **Figure 3**, Part D, and **Appendix 2**.

Association between the equipment of universities and the choice of teaching methods

The majority of participants (n = 461 out of 526) stated that their educational institutions possess the required resources for training programs. However, 46% of respondents (n = 242) reported using educational facilities for teaching. **Table 4** presents a summary of the teaching methodologies employed by the teachers.

Table 3. The classification of basic science teachers group based on the variables studied

Variable	Sub variable	Frequency	Percent (%)
Sex	Male	120	48.6
	Female	127	51.4
Age (years)	25-30	9	3.6
	31-40	131	53
	41-50	58	23.5
	Over 50	49	19.8
Professional Academic	Assistance professor	133	53.8
	Associate professor	61	24.7
	Professor	44	17.8
	Educator	9	3.6
Learning Style	Visual	131	53
	Auditory	47	19
	Reading and Writing	43	17.4
	Kinesthetic	26	10.5
Teaching Method	Lecture	104	42.1
	Group discussion	49	19.8
	Roleplay	14	5.7
	Gamification	29	11.7
	Flip classroom	26	10.5
	Project-based learning	12	4.9
	Problem-based learning	7	2.8
	Case-based learning	6	2.4

Note: This table presents a descriptive frequency analysis of the basic science teacher participants based on various categorical variables.

Table 4. The frequency and percentage of educational facilities and their use based on the teaching methods of teachers

Teaching method	Number	Existed facilitated	Used facilitated
Lecture	223	182 (82%)	43 (19%)
Group discussion	89	77 (86%)	54 (61%)
Roleplay	28	25 (89%)	11 (39%)
Gamification	45	43 (95%)	21 (47%)
Flip classroom	74	72 (97%)	62 (83%)
Project-based learning	30	29 (96%)	25 (83%)
Problem-based learning	20	18 (90%)	16 (80%)
Case-based learning	17	15 (88%)	10 (59%)
Total	526	461 (88%)	242 (46%)

Note: This table is focused on the collective participation of all teachers involved in the study. The specific grouping or categorization of teachers is not taken into account, as the primary focus of this section was to explore the correlation between university classification and selected teaching methods.

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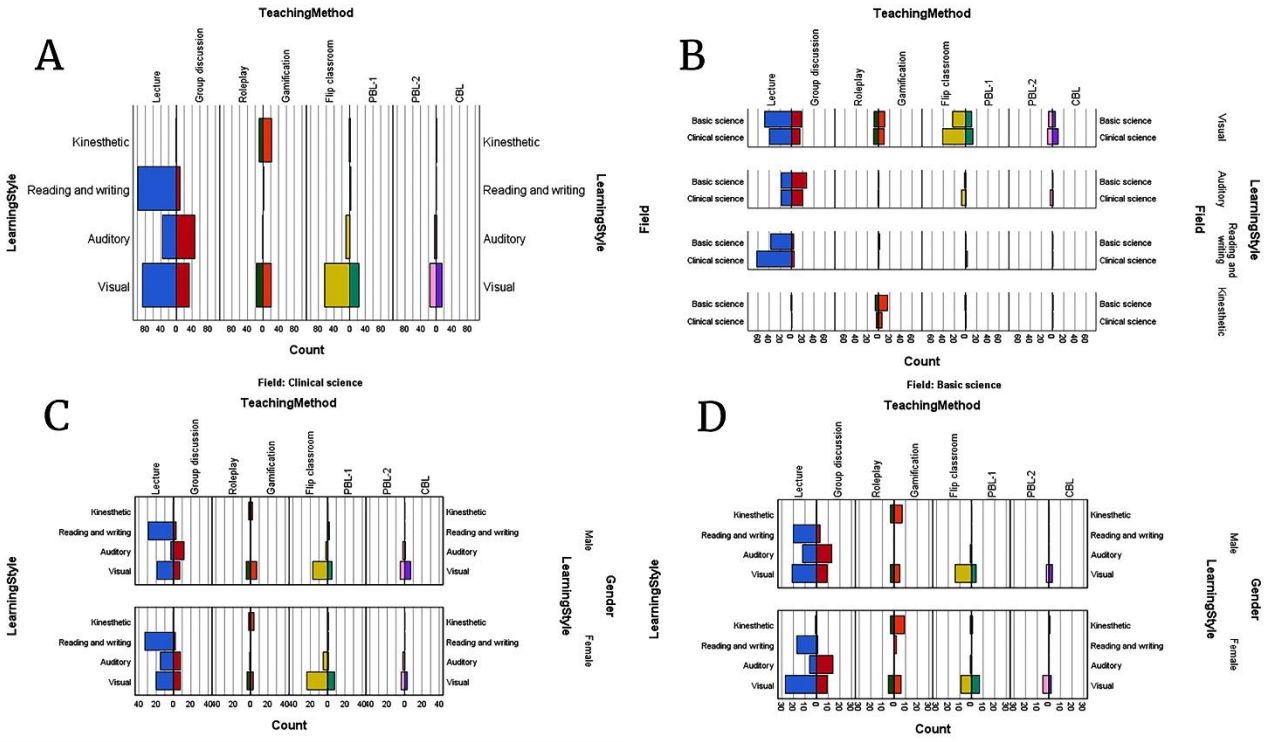

Figure 3. The figure compares the relative frequency of teachers from two groups in their selection of teaching methods and preferences in learning styles.

Note: In particular, sub-figure (A) displays the frequency of teaching methods and learning styles preferred by all participating teachers, whereas sub-figure (B) shows the frequency of preferences for learning styles and teaching methods used by each discipline. Moreover, sub-figure (C) illustrates the frequency of learning style preferences and choice of teaching method based on the gender of clinical teachers, and sub-figure (D) displays the frequency of preferences in learning style and choice of teaching method based on the gender of basic science teachers.

Discussion

The correlation between teaching methods and learning styles has been a topic of substantial discourse among teachers and researchers over an extended period, with possible ramifications for the quality and efficacy of education. However, previous research on this topic has primarily focused on students rather than teachers, employing self-reported assessments of learning styles rather than objective evaluations (8, 32–34). As a result, this study sought to fill this vacuum by investigating the association between teaching methods and learning styles among faculty members utilizing a large sample size and regression analysis. The study found a significant relationship between academic profession and learning styles. Despite conducting research, no significant correlations were found between learning styles and characteristics such as age, gender, or field of study. These outcomes imply that teachers tend to prefer teaching techniques that align with their personal learning preferences, regardless of their demographic profiles or areas of expertise.

This is consistent with research by Rappel et al. (35) and Black et al. (36) that found a positive correlation between learning styles and teaching methods. In line with this, Chevanese LaToya Samms highlighted in his doctoral dissertation that teachers' preferred teaching methods may be influenced by their learning experiences. Bergmark et al. (37) found previously unreported disparities between genders and specialties. This study emphasizes the relevance of thinking about learning styles since it can help teachers and students become more aware of their own learning preferences and talents. Individuals can select tactics and materials that are appropriate for their personal academic goals by assessing their learning styles (38). Diagrams, charts, and movies, for example, may benefit visual learners, but

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lectures, podcasts, and discussions may help auditory learners grasp more.

Further support for this notion comes from Meishar-Tal et al. (39) and Mena Lorenzo et al. (40), who provide additional support for this theory, arguing that understanding different learning styles helps educators diversify teaching strategies to satisfy the needs of all students. For example, clinical teachers who like reading/writing could include group discussions or role-playing activities to engage students with different learning styles. Primary science teachers, on the other hand, who prefer visual aids may benefit from incorporating gamification or problem-based approaches to better encourage diverse students. This method encourages a more inclusive environment in which all students actively participate (41, 42).

Our study found a significant relationship between learning preferences and teaching methods, and the literature examined also highlighted the importance of learning styles in selecting teaching tactics (43, 44). However, there are significant drawbacks to incorporating learning styles into the classroom. According to Riener's research, one disadvantage is the inaccuracy and variability of learning styles, which are influenced by various factors, including context, content, mood, and motivation (45). Another study by Resmi demonstrates that learning styles are changeable preferences that can change over time and in different settings (46). As a result, overreliance on learning styles may limit learners' potential and impair their capacity to adapt to varied educational contexts (47). For example, a student who identifies as a visual learner may struggle with a text-heavy exam.

In contrast, a teacher who prefers aural instruction may need help to teach a topic like anatomy, which requires visual comprehension. Rogowsky et al.'s findings support this position, demonstrating that emphasizing learning styles might lead to stereotyping and labeling individuals based on their preferences, thus hurting their self-esteem and academic prospects. For example, a male student who is an aural learner may feel inferior to his female classmates who favor RVA (Reading, Viewing, and Analyzing) methods. In another case, a teacher with a kinesthetic learning style and a gamification approach may be seen as less competent than colleagues who employ more traditional teaching methods. Based on the findings of this study and the literature analysis, we recommend that instructors have a thorough awareness of their learning styles and modify their teaching approaches accordingly. It is critical that they not only discover appropriate approaches but also investigate additional teaching techniques in order to establish a thriving learning environment. This nuanced thinking is especially obvious in classes that require careful consideration of the distinct teaching and learning strategies associated with various types of learners (49).

Our study's findings imply that teachers' choice of teaching methods is impacted by their unique learning styles and preferences rather than the availability or quality of resources. This is consistent with prior studies, which found a positive relationship between learning styles and instructional techniques (23, 50-52). However, this raises concerns about whether educators use available resources entirely and recognize the potential benefits of introducing unique or creative teaching practices tailored to specific learners and circumstances. As a result, these findings call into question numerous long-held assumptions and suggestions in the literature on blended and active learning, such as the importance of providing adequate resources to support progressive student-centered teaching techniques (53). Furthermore, Guiwen et al. claim that educators' probable lack of computer skills and difficulties with practical tasks in the classroom due to their academic training programs offer light on another crucial component of teacher readiness (54). Istenič thinks these findings may be disconcerting, as pupils typically look up to their professors as role models (55). Boland et al.'s research validate these findings, indicating the positive impact of tailoring teaching approaches to individual learning styles on closing educational inequalities (56). Understanding a teacher's preferred learning and teaching style may serve as a bridge across various learning types.

Hence, it becomes apparent why dedicating at least one session during class preparation to discussing personal teaching approaches and student learning styles is essential for achieving true educational success. The study's findings provided compelling evidence of the substantial impact that learning styles have on choosing teaching methods. Furthermore, it explains how teachers' learning experiences influence their instructional strategies. In this setting, the study emphasized the vital necessity for educators to gain experience in efficiently harnessing technology and seamlessly incorporating it into their educational practices. Furthermore, this study stressed the need to tailor teaching techniques to individual learning styles to reduce educational disparities and build comprehensive knowledge in pupils. The study highlights the critical importance of providing teachers with comprehensive technical

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training to enable them to make the most of educational resources available to them. Furthermore, it revealed a troubling trend in educators needing to use electronic resources more frequently. Delving deeper into the findings highlighted the importance of understanding individual learning preferences and providing an inclusive atmosphere accommodating varied classroom learning styles. The study recommended that teachers carefully adjust teaching materials and activities to satisfy these diverse demands. This study sought to provide insights for both educators and students by investigating the relationship between teachers' learning styles and teaching approaches. However, because the study is based on self-reporting, there is a risk of response bias and personal perceptions, which could jeopardize the analysis's reliability and objectivity.

Conclusion

This study investigated the correlation between teaching methods and learning styles among faculty members and found a significant relationship between the two. Specifically, the study demonstrated a strong correlation between academic profession and learning styles. While age, gender, and field of study did not significantly impact learning styles, an interesting effect was observed between age group and learning styles with regard to teaching methods. Most participants preferred reading and writing as their learning styles, followed by visual and aural. It is worth noting that the teaching methods used differed depending on the individual learning preferences.

Furthermore, disparities in learning styles and preferred teaching approaches were observed between clinical and basic science teachers and across genders. These findings show that teachers should be mindful of their personal learning tendencies and how they may influence their teaching tactics. Furthermore, teachers should recognize the diversity of their students' learning styles and use a variety of teaching tactics to accommodate different learning preferences.

Ethical considerations

The research in question adhered to the principles outlined in the Declaration of Helsinki. Before commencement, ethical approval was granted by the university's Institutional Review Board under protocol number I.R.VUMS.REC.1401.015. No experimental procedures were performed as part of this study. All data collection followed the I.R.B. rules and was based on instructors' voluntary responses using an anonymous questionnaire format. Furthermore, each participant gave informed consent after obtaining thorough information regarding the investigation's objective and parameters, all supplied at the beginning of the questionnaire. It is worth mentioning that this study's outcomes were interpreted using group analysis rather than individual assessments.

Artificial intelligence utilization for article writing

The authors carefully carried out all stages of this study, encompassing writing, detailed data analysis, and thorough research for sources.

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Conflict of interest statement

The authors have no conflict of interest in disclose

Author contributions

M.M.H. and S.R. designed and supervised the procedure. M.M.H. performed the study intervention and collected data. M.M.H. designed and developed the online survey. M.M.H. and S.M.E. analyzed the data. S.R.: Conceptualization, Data curation, investigation. S.R.: Methodology, Writing—review and editing. All authors read and approved the manuscript.

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Data availability statement

The corresponding author can provide the data sets analyzed during this study upon a reasonable request.

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Appendix 1. Relation between learning style and teaching methods in clinical teachers

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Teaching Methods	Professional Academic	Sex	Learning Style							
			Visual		Auditory		Reading and Writing		Kinesthetic	
			F	P	F	P	F	P	F	P
Lecture	Assistance professor	Male	9	n = 39 P = 32.8%	0	n = 18 P = 15.1%	10	n = 62 P = 52.1%	0	n = 0
		Female	10		4		10		0	
	Associate professor	Male	8		3		11		0	
		Female	8		11		10		0	
	Professor	Male	0		0		4		0	
		Female	0		0		9		0	
	Educator	Male	2		0		4		0	
		Female	2		0		4		0	
Group discussion	Assistance professor	Male	4	n = 15 P = 37.5%	1	n = 20 P = 50 %	2	n = 5 P = 12.5 %	0	n = 0
		Female	3		2		0		0	
	Associate professor	Male	2		4		1		0	
		Female	4		5		1		0	
	Professor	Male	0		2		0		0	
		Female	0		0		0		0	
	Educator	Male	1		5		0		0	
		Female	1		1		1		0	
Roleplay	Assistance professor	Male	3	n = 9 P = 64.3%	0	n = 1 P = 7.1%	0	n = 0	0	n = 4 P = 28.6 %
		Female	2		1		0		0	
	Associate professor	Male	1		0		0		0	
		Female	2		0		0		0	
	Professor	Male	1		0		0		0	
		Female	0		0		0		0	
	Educator	Male	0		0		0		2	
		Female	0		0		0		2	

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Gamification	Assistance professor	Male	1	n = 10 P = 62.5%	0	n = 0	0	n = 0	1	n = 6 P = 37.5 %
		Female	2		0		0		1	
	Associate professor	Male	4		0		0		0	
		Female	1		0		0		2	
	Professor	Male	1		0		0		0	
		Female	0		0		0		0	
	Educator	Male	1		0		0		1	
		Female	0		0		0		1	
Flip classroom	Assistance professor	Male	12	n = 41 P = 85.4%	1	n = 7 P = 14.6%	0	n = 0	0	n = 0
		Female	18		2		0		0	
	Associate professor	Male	1		0		0		0	
		Female	5		1		0		0	
	Professor	Male	0		0		0		0	
		Female	0		0		0		0	
	Educator	Male	4		2		0		0	
		Female	1		1		0		0	
Project-based learning	Assistance professor	Male	2	n = 13 P = 72.2%	0	n = 1 P = 5.6 %	1	n = 3 P = 16.7 %	0	1 2 0 1 0 0 2 1
		Female	4		1		1		1	
	Associate professor	Male	2		0		0		0	
		Female	2		0		0		0	
	Professor	Male	0		0		0		0	
		Female	0		0		0		0	
	Educator	Male	1		0		1		0	
		Female	2		0		0		0	
Problem-based learning	Assistance professor	Male	3	n = 9	2	n = 4	0	n = 0	0	n = 0

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			Female	2	P = 69.2%	0	P = 30.8%	0	0	
		Associate professor	Male	1		0		0	0	
			Female	2		0		0	0	
		Professor	Male	1		0		0	0	
			Female	0		1		0	0	
		Educator	Male	0		0		0	0	
			Female	0		1		0	0	
Case-based learning		Assistance professor	Male	2		1		0	0	
			Female	2		0		0	0	
		Associate professor	Male	3		0		0	0	
			Female	1	n = 10	0	n = 1	0	0	n = 0
		Professor	Male	1	P = 90.9%	0	P = 9.1%	0	0	
			Female	0		0		0	0	
		Educator	Male	1		0		0	0	
			Female	0		0		0	0	

Note: This table appears to be a cross-tabulation, possibly derived from a larger dataset. It shows frequencies and percentages of clinical teachers using specific teaching methods categorized by their learning styles, professional background, and sex.
Abbreviations: F, frequency; P, percent; n, sample size for the category.

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Appendix 2. Relation between learning style and teaching methods in basic sciences teachers

Teaching Methods	Professional Academic	Sex	Learning Style							
			Visual		Auditory		Reading and Writing		Kinesthetic	
			F	P	F	P	F	P	F	P
Lecture	Assistance professor	Male	9	n = 48 P = 46.2%	2	n = 18 P = 17.3%	6	n = 37 P = 35.6%	0	n = 1 P = 1%
		Female	9		0		3		0	
	Associate professor	Male	10		9		5		0	
		Female	18		5		2		0	
	Professor	Male	2		1		9		0	
		Female	0		1		12		0	
	Educator	Male	0		0		0		0	
		Female	0		0		0		0	
Group discussion	Assistance professor	Male	9	n = 18 P = 36.7%	4	n = 27 P = 55.1%	3	n = 4 P = 8.2%	0	n = 0
		Female	7		8		0		0	
	Associate professor	Male	0		3		0		0	
		Female	1		1		0		0	
	Professor	Male	0		4		0		0	
		Female	1		5		1		0	
	Educator	Male	0		2		0		0	
		Female	0		0		0		0	
Roleplay	Assistance professor	Male	3	n = 8 P = 57.1%	0	n = 0	0	n = 0	3	n = 6 P = 42.9%
		Female	3		1		0		2	
	Associate professor	Male	0		0		0		0	
		Female	1		0		0		1	
	Professor	Male	0		0		0		0	
		Female	1		0		0		0	
	Educator	Male	0		0		0		0	
		Female	0		0		0		0	

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Gamification	Assistance professor	Male	1	n = 11 P = 37.9%	0	n = 0	0	n = 2 P = 6.9%	5	n = 16 P = 55.2%
		Female	2		0		1		5	
	Associate professor	Male	3		0		0		0	
		Female	6		0		0		1	
	Professor	Male	0		0		1		0	
		Female	0		0		0		3	
	Educator	Male	0		0		0		0	
		Female	0		0		0		2	
Flip classroom	Assistance professor	Male	12	n = 23 P = 88.5%	1	n = 2 P = 7.7%	0	n = 0	0	n = 1 P = 3.8%
		Female	9		1		0		0	
	Associate professor	Male	0		0		0		0	
		Female	0		0		0		0	
	Professor	Male	1		0		0		0	
		Female	0		0		0		0	
	Educator	Male	1		0		0		0	
		Female	0		0		0		0	
Project-based learning	Assistance professor	Male	3	n = 11 P = 91.7%	0	n = 0	0	n = 0	0	n = 1 P = 8.3%
		Female	4		0		0		1	
	Associate professor	Male	1		0		0		0	
		Female	1		0		0		0	
	Professor	Male	0		0		0		0	
		Female	1		0		0		0	
	Educator	Male	0		0		0		0	
		Female	1		0		0		0	
Problem-based	Assistance professor	Male	1	n = 7	0	n = 0	0	n = 0	0	n = 0

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			Female	3	P = 100%	0		0		0
		Associate professor	Male	0		0		0		0
			Female	1		0		0		0
		Professor	Male	1		0		0		0
			Female	1		0		0		0
		Educator	Male	0		0		0		0
			Female	0		0		0		0
Case-based learning		Assistance professor	Male	3	n = 5 P = 83.3%	0	n = 1 P = 16.7%	0	n = 0	0	n = 1 P = 16.7%
			Female	2		0		0		0
		Associate professor	Male	0		0		0		0
			Female	0		0		0		0
		Professor	Male	0		0		0		0
			Female	0		0		0		0
		Educator	Male	0		0		0		0
			Female	0		0		0		0

Note: Classification of basic science teachers is determined by their chosen teaching method, and their learning style was obtained through the VARK questionnaire while also considering gender and academic profession.
Abbreviations: F, frequency; P, percent; n, sample size for the category.

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