



Correlation Between Learning Styles and Online Interaction among Postgraduate Students in Universiti Teknologi Malaysia, Malaysia

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Abstract

Learning styles in relation to online interaction is still a belligerent issue especially at postgraduate level, online teaching and learning are vital, their successes or failures depends so much on interaction. Although learning style is widely considered to be a determinant of online interactions among students, yet very few studies have established relationship between the two. This research aimed at finding out the relationship between learning style and online interaction of the postgraduate students of the University Technology Malaysia (UTM). The study used survey questionnaire as an instrument for data collection, convenience systematic sampling technique was used, a total of 210 questionnaires were distributed to the post-graduate students of the UTM, and 150 questionnaires were fully completed and returned. VARK inventory version 7.8 was integrated into a survey to identify the learning styles of the participants, The data obtained was analyzed statistically, eventually the responses were classified into four learning styles: visual, aural, read/write and kinesthetic; while the other aspect of the questionnaire captured data on online interaction of the respondents, correlations between participants' learning styles and online interaction was statistically computed using SPSS nonparametric tool- Chi Square. The results indicated that kinesthetic was the preferred learning style of the respondents and there was no relationship between learning style and online interaction. This research extends earlier studies by finding out if really students use VARK learning styles to learn, the study is of great importance to both instructors and students.

Keywords: Learning Style, VARK Model, VARK Inventory, Online Interaction, Post Graduate Students

Introduction

There are many definitions of learning styles yet there is no single definition that is universally accepted, however, various researchers made several attempts to define the concept. Learning styles was defined as individual's distinctive choice in terms of receiving, processing, remembering and relating with information during learning activities (Indriatik & Rahma, 2024). Learning style is also conceptualized as the way by which the learner manages, processes, represents, and combines data and preserves it in his mental reservoir, then recovers the information and experiences in the style that replicates his technique of communicating while learning (El-Sabagh, 2021). This is a very comprehensive and functional definition as it describes the two essential elements of learning style: how individual learner processes information and demonstrates learning. There are numerous ways of classifying learning styles and students are found in every one of them, some of the prominent learning style models include the following: VARK Model, the Four-Dimensional Model, the Kolb Experiential Learning Model, the Honey & Mumford Model (Practical Adaptation of Kolb) and the Grasha-Riechmann Model- this is very popular for social interaction. Most of the learning style models have their peculiar inventories for researchers to use them for data collection. Therefore, this study focuses on the VARK learning styles (Visual, Auditory, Read/Write and Kinesthetic). However, VARK is an inventory model for identifying individual's learning style, it is an acronym which refers to Visual Aural Read/Write and Kinesthetic. The model originated from VAK model; it was modified to VARK by Neil Fleming in the year 2006. VARK categorized learners into four different types based on the individual senses: Visual, Aural, Reading/Write and Kinesthetic. VARK is one of the most famous models used to categorise learners according to their styles (El-Sabagh, 2021). VARK has its peculiar questionnaire, VARK has been used for various educational purposes and it has been very operational in assisting students to enhance their academic skills as a result of identifying their learning styles (Rashid et al., 2023). One of the advantages of the VARK questionnaire is that the questions define real life situations that individuals can simply comprehend and relate to daily experience. It was established that VARK is the most widely used inventory among all the learning style inventories (Hattie & Yates, 2013). A learner's preference may not certainly

Correlation Between Learning Styles and Online Interaction among ... Lawal, Y. & Rosli, M. S. (2026)

signify their strong points; a person may be discovered to possess an aural preference that is best by listening that would not repudiate him from benefitting from reading information. A lot of literature discussed immensely on the factors affecting learning styles such as sex, age, teaching methods or even the learning style of the teacher himself. Some researchers have reiterated the importance of matching learning style and teaching style; they emphasized that teachers should amend their teaching styles to match their students' learning styles. Kuluşaklı suggested that learning styles be incorporated into the teacher education programs so that teachers would understand the various nature of learning styles and know what types of learning strategies should be used to develop students' learning. He further explained that if students understand their learning styles it can help them to increase their learning strategies to attain high academic goals (Kuluşaklı, 2026). If students identify their own learning style, they will be able to incorporate it into their learning process. Comprehending learning styles can assist in making more effective learning experience because there is a significant influence of learning style on student learning outcomes (Nurjannah et al., 2024). Students are made conscious of their own learning styles to enhance the quality of their learning process to become flexible learners, (Lau Kiat Hiong & Ying-Leh Ling, 2020). Furthermore, online interaction can be defined as any form of transfer of information, message, or societal intercourse between people otherwise between a person and a virtual platform such as collaborative instruments, social media, digital games, Learning Management System (LMS), blogs, and virtual forums in synchronous or asynchronous format. The famous literature on online interaction was published by Michael G. Moore, he classified interaction into three main categories: Learner-Content interaction, Learner-Instructor interaction and Learner-Learner interaction (Moore, 1989). Moreover, Hillman, Willis, and Gunawardena eventually advocated Learner-Interface Interaction. They argued that the types of interaction identified by Moore neglected the interaction that takes place when a learner uses prevailing technologies to relate with the content, the instructor and other students. They observed that the interaction between the learner and the technology is a crucial component that delivers instruction (Hillman et al., 1994). Moreover, social network sites are used for different purposes including education in order to improve learning; through these instruments like Facebook, X, WhatsApp, e-learning etc. discussions are held for online academic interaction which can be used to measure online interaction quantitatively or qualitatively (Wanpen, 2013). Over the years, learning style is drawing increased attention among the global scholars in the realm of teacher education, what seriously baffles them is learning style in relation to online interaction. There are a lot of topical researches carried out to investigate issues related to learning styles and /or online interaction but researches that focused solely on post-graduate are not very much available. In line with this, this research focusses on the learning style and online interaction of the postgraduate students of the University Technology Malaysia (UTM).

Statement of the Problem

Every individual is unique, but why is individual difference being neglected while planning lessons? The idea of individual differences is not new in the teaching and learning process, it has been professionally recognized and established that some problems associated with pedagogy can best be tackled if individual attention is offered. Individual differs in intelligence, temperament, learning style, physical appearance, etc. since students have different features, their learning styles need to be put into cognizance in teaching and learning situation especially at tertiary institutions (Kuluşaklı, 2026). Learning style is one the fundamental aspects of individual differences which manifests how people learn differently. Accordingly, additional research is needed to elucidate the extent to which learning styles contribute to technology-mediated situations (Tedi Gandara et al., 2025). El-Sabagh (2021) established that new studies are needed to design operational environments in which adaptive learning can be used to enhance academic performance and motivation; he also stressed the need for new quasi-experimental and descriptive studies to better comprehend the advantages and challenges of integrating adaptive e-learning in higher education institutions. Therefore, more researches are deemed necessary in order to elucidate the level at which learning styles meaningfully supports technology-facilitated settings and how they interrelate with other elements such as Learning Management System (LMS), artificial intelligence, and learner technological proficiencies (Tedi Gandara et al., 2025). Research has shown that several studies on learning styles failed to identify the preferred learning styles of online learners, as such, there is need for research in this area to fully study the variables (De Corte, 1990).

The Purpose of the Study

The purposes of this research are to identify the most preferred element among the VARK learning styles model of the UTM post-graduate students, to identify whether UTM postgraduate students use VARK learning styles to learn, to identify the rating of the UTM post-graduate students on their participation in online interaction and to discover the relationship

Correlation Between Learning Styles and Online Interaction among ... Lawal, Y. & Rosli, M. S. (2026)

between learning styles and online interaction of the postgraduate students of the University Technology Malaysia. It is envisioned that certain learning style makes a difference in online interaction and this difference plays a major role in academic interaction of the students which later makes a significant impact on their educational performance.

Objectives of the Study

The research has the following objectives:

1. To identify the preferred element of VARK learning styles of the UTM post-graduate students.
2. To identify whether UTM postgraduate students use VARK learning styles to learn.
3. To identify the rating of the UTM post-graduate students on their participation in online interaction.
4. To investigate the relationship between learning styles and online interactions among UTM post-graduate students.

Research Questions

This research has the following questions:

1. What is the preferred element of VARK learning styles of the UTM postgraduate students?
2. Do UTM postgraduate students use VARK learning styles to learn?
3. How would the UTM post-graduate students rate their participation in online interaction?
4. Is there any relationship between VARK learning styles and online interaction?

Null Hypothesis

The following null hypothesis was formulated and tested.

There is no relationship between learning style and online interaction among UTM post-graduate students

Methodology

The participants were the postgraduate students of the University Technology Malaysia from the following faculties: Engineering, Social Science and Humanities, Built Environment and Surveying and the Faculty of Science. The sample varied in relations to age, gender, and academic statuses. The researchers used convenience systematic sampling where every single third person who was going into the main library of the UTM during the sampling period was scientifically chosen. Gravetter and his associates stressed that this sampling method assists researchers to realize extensive representation (Gravetter, F. J et al., 2026). Two questionnaires were merged and used in the survey, the first was the adopted VARK questionnaire version 7.8 which contained 16 items that measured the learning styles of the samples. The second was the questionnaire developed by the researchers which contained 12 questions that measured online interaction of the participants. The researchers used self-reported survey where participants were asked to rate their online interaction according to their individual perception. Self-reported survey is one of the effective measurement approaches used for measuring online interaction (Christian & John, 2010). Questions were designed in a Likert Scale format, the participants were asked to indicate their level of (dis)agreement on a question based on the Likert Scale pattern, the five point rating scale format: Strongly Disagree (SD) = 1 points, Disagree (D) = 2 points, Moderately Agree (MA) = 3 points, Agree (A) = 4 points, and Strongly Agree (SA) = 5 points. The instrument was subjected to content validity by Test and Measurement experts in the Faculty of Education, University Technology Malaysia and Prior to the study, the research instrument was pilot tested. Cronbach's Alpha was used to assess internal consistency of the scores, the result of the reliability test revealed that the questionnaire had high internal consistency level with Cronbach's Alpha 0.74 this signifies a very adequate level of reliability (Taber, 2018). Thus, to identify the distributions of learning styles among the participants, the researchers used the adopted VARK inventory, it was analyzed by using simple percentage and frequency. The data collected on online interaction and relationship between learning style and online interaction were analyzed with the aid of Statistical Package for Social Science (SPSS) software version 20; Pearson Chi Square was used to determine the relationship between the students' learning styles and their online interaction at 0.05 level of significance.

Presentation of Results

A total of 210 questionnaires were disseminated to the participants, 150 questionnaires were entirely completed and returned, demonstrating 71.43% response rate; the results of the study were obtained and tabulated accordingly. The participants of this research were the post-graduate students of the University Technology Malaysia (UTM), among the 150 respondents, 56% were males while 44% were females. 81.3% were Masters Students, only 18.7% were PhD students; furthermore, 45.3% of the respondents were married whereas 54.7% were single.

Correlation Between Learning Styles and Online Interaction among ... Lawal, Y. & Rosli, M. S. (2026)

Table 1

The Learning Styles of the Respondents

Learning Styles	Frequency (F)	Percent (%)
Visuals	30	18.4
Aural	35	21.5
Read/Write	31	19.0
Kinaesthetic	67	41.1
Total	163	100%

Table 1 presents information on the learning style of the respondents, the data collected from the VARK questionnaire were analyzed using frequency and percentages in order to identify the distributions of learning style of the participants. It can be observed that the summation of the four categories is 163 instead of 150; this is because VARK questionnaire have endorsed multiple answers, owing to that, thirteen (13) participants had dual learning styles. The result presented indicates that the kinesthetic learning style had the highest percentage (41.1%), followed by Aural with 21.5%, Read/Write 19% and Visual learners 18.4%.

Table 2

Participants' Usage of Learning Styles

Item Statements	SD	D	MA	A	SA	MEAN	ST.DEV
I use my learning style to learn	3	1	15	79	52	4.17	.79
I learn easily if I use my learning style	3	3	8	84	52	4.19	.79
I learn faster if teaching is in line with learning style	5	2	12	79	52	4.14	.88
I use my learning style only if I have a complex learning task.	6	34	43	47	20	3.27	1.08
Using learning style is part of my learning strategy.	4	5	25	79	37	3.93	.89

Table 2 presents information on participant's usage of learning styles, the table reveals that the respondents unanimously agreed on all the items of the above table especially on: personal usage of learning style, simplicity and speed of learning if related to learning style with mean score of 4.17, 4.19 and 4.14 respectively. Other items in the table on the complexity of learning task and learning strategy all support the participants' usage of learning style looking at their mean score: 3.27 and 3.93.

Table 3

Rating of Respondents' Participation in Online Interaction

Rating	Frequency (F)	Percentage (%)
Very Low	3	2.0
Below Average	11	7.3
Average	67	44.7
Above Average	51	34.0
Very High	17	11.3

Table 3 presents the rating of respondents' level of participation in online interaction, Average was the highest with 44.7% of the total samples' responses; the second highest was Above Average with 34.0% while 11.3% believe that they were Above Average.

Table 4

Correlation between Learning Styles and Online Interaction

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	14.605 ^a	12	.264
Likelihood Ratio	16.769	12	.158



Correlation Between Learning Styles and Online Interaction among ... Lawal, Y. & Rosli, M. S. (2026)

Linear-by-Linear Association	.587	1	.443
N of Valid Cases	150		

Table 4 presents the result of the relationship between learning styles and online interaction, the correlation between the respondents' learning styles and their online interaction was performed using Pearson Chi-Square test, and the table indicates that the value is 14.605^a with 12 degree of freedom (DF) while the significance level is .264.

Discussion of Findings

A large number of the samples of this study was kinesthetic learners, this means that they possess exceptional hand-eye coordination abilities. Kinesthetic learners have a preference of learning by means of direct practice, besides, kinesthetic learning style is also branded as “learning by doing”. They learn effectively if they are engaged energetically with their environment and in activities such as practical and excursions especially if it involves the use of multiple senses, kinesthetic style can be instrumental in developing technical skills of students, a number of researchers have found that their samples were kinesthetic learners (Shah et al., 2013; Whillier et al., 2014). In a reputable study conducted at middle and high school students in Bosnia and Herzegovina, the result showed that the auditory learning style was the most preferred learning style for (Adela Mašić et al., 2020). In another study on Learning strategies and learning styles in distance learning in higher education the most preferred learning style was the logical learning style (Kuluşaklı, 2026). Apparently, a number of researches have shown that if learning styles of the learners are identified and instructions are focused toward the preferred learning styles of the learners, learning can be enhanced (El-Sabagh, 2021). This shows that the awareness of learning styles has implications for both the instructors and the students. If students discover their learning preferences, it considerably benefits them to use the proper learning strategies, and this makes the students to become self-directed learners and use most of their true potentials. Moreover, if teachers are aware of the students' learning styles they can integrate their teaching approaches to conform to the students' learning preferences, this produces an effective learning environment (Nurjannah et al., 2024). It is established that learning styles is an essential component of enhancing the efficiency of adaptive learning because every individual is unique in processing information, therefore, using VARK model gives room for customisation of leaning material to suit individual learner. This customisation enhances learning outcomes, motivation and online interaction during the learning process (Indriatik & Rahma, 2024).

The result of this research reveals that the participants used their learning styles, the samples strongly agreed that they used their learning styles to learn; this implies that learning style is very important to the samples and their decisions or actions affect their learning. When one uses his/her learning style he/she may not necessarily get the best academic result but he will be comfortable on the process of learning and can cope with complex learning situations. Some researchers have established that there is correlation between learning style and students' academic accomplishment. In another similar research conducted in higher institution and at the same time used VARK learning styles model established that based on students' learning style (kinesthetic; auditory; visual; read/write), adaptive content has a positive influence on adaptive individual's academic attainment and online interactions with content, peers, and instructors (El-Sabagh, 2021). In another correlational research, it was found out that kinesthetic learning styles proved to possess reasonable positive correlation with academic performance (Tedi Gandara et al., 2025). Nurjannah et al., (2024) established that learning styles stimulates the students to accomplish academic achievement. The participants of this research indicated that they use their VARK learning styles ubiquitously even in learning situations that are not complex, in addition, using their learning styles is one of their strategies for learning. This means that the samples internalize the attitude of using learning styles in their academic undergoing; the participants of this research showed that learning is faster if teaching is in line with their learning style. This is consistent with the some notable studies which have argued that teaching style should be planned in accordance with the learning styles of the learners (Kuluşaklı, 2026; Nurjannah et al., 2024). Moreover, on the issue of participants' partaking on online interaction, the findings of this research indicate that the respondents significantly rated themselves high that they frequently participate in online interaction. Thus, only 2.0% and 7.3% rated themselves very low and below average respectively. Furthermore, the data reveals the extent to which an individual sample participates in online interactions, the general belief of the samples is that they participate tremendously in online interaction. This study is very consistent with Lamon and his partners who established that interactive activities and external video links were the second most preferred learning activity in online postgraduate course, and that students value personal interaction and

Correlation Between Learning Styles and Online Interaction among ... Lawal, Y. & Rosli, M. S. (2026)

instantaneous feedback (Lamon et al., 2020). Thus, on the relationship between learning style and online interaction, the result of this research shows that the P value was 0.264 which is more than the alpha value ($p > 0.05$). This means that the null hypothesis is accepted, that is, there is no relationship between learning styles and online interactions. The implication is that the learning styles of students do not affect their online interactions; in other words, the online interactions of the participants are not determined by their learning styles. Shaw reported no significant relationship between learning styles and online participation, although the participants interact in the forum, yet no significant association was found between their learning styles and their interactive behaviours (Shaw, 2012). On the other hand, Wanpen (2013) stressed that relationships exist between some features of learning styles and the use of social network interactions, this information is very instrumental for planning discussion activities for the blended learning. In a learning situation, social interaction is very broad, it comprises working together with classmates, deliberating with the teacher, or engaging in group activities and virtually it also includes interaction by using keyboard, that is Learner-Key-board-Interaction. Nurjannah et al., (2024) found out that social interaction has a significant influence on learning outcomes. Thus, Huang and his colleagues found a significant association between learning styles and students' online participatory interaction; their study is inconsistent with the present research because this study have established that there is no relationship between learning styles and online interactions (Huang et al., 2012). Moreover, in online learning platforms, students who are visual and kinesthetic learners support more successfully with digital platforms and may benefit more from multimedia and interactive content (Tedi Gandara et al., 2025). Cheng and Chau found out that learning styles are significantly correlated with student's participation in information access, interactive learning, networked learning, and materials development; they concluded that that learning styles are significantly related to online participation (Cheng & Chau, 2016). The possible reason that may cause this inconsistency may be because this research was conducted in a University of Technology where majority of the students' learning style is kinesthetic who by their nature prefer practical engagement rather than passive participation.

Conclusion

Kinesthetic learning style is crucial for students in the area of technology; teachers should focus their instructional methods toward hands-on or proactive strategies in order to meet the needs of the kinesthetic learners. This research concludes that there is no relationship between learning styles and online interaction; however, the implication here is that instructors should not put so much emphasis on learning styles of the students while planning and engaging them in online interaction as it has no relationship with online interaction.

Recommendations

The Study recommended that;

1. Instructors should use multiple methods of teaching as much as possible for the fact that one method or strategy cannot satisfy all the learners.
2. Instructors should strive to understand students individually this helps in taking care of their differences.
3. Further researches should investigate if there is association between kinesthetic learning style and Learner-Interface interaction.

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Correlation Between Learning Styles and Online Interaction among ... Lawal, Y. & Rosli, M. S. (2026)

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