

Students' Learning Styles and Attitude Towards Online Learning: A Correlational Study

Michael Angelo A. Legarde

Palawan State University

Puerto Princesa City, Palawan, Philippines

malegarde@psu.palawan.edu.ph

Abstract: *Online learning is still a contentious topic today, particularly in educational institutions that have yet to openly use it. Research studies revealed that online courses will appear more engaging if there is a combination of resources that appeal to a wide range of learning styles, which will provide students multiple ways to learn. Hence, it is the researcher's belief that if students' perceptions of online learning are correlated to their learning styles, it will aid in its enhancement, particularly in terms of implementation. Thus, the goal of this study is to identify students' learning styles and examine if they influence their perception of the effectiveness and relative benefits of online learning. A correlational research design was used to address the queries raised in this study. An electronic survey and an online VARK questionnaire were used to collect the data. The study included 100 education students from a state university in the Philippines. The study revealed a substantial relationship between students' learning styles and their attitudes toward online learning. These findings strongly suggest that relevant learning activities be designed using information and communication technology so that students can obtain content that best suits their needs and learning preferences, resulting in student satisfaction with learning and, ultimately, academic success. Teachers should also expose their students to varied learning activities to address their learning diversities.*

Keywords—Learning Styles, VARK, Online Learning, Attitude, Correlational Study

1. INTRODUCTION

Today, online learning remains a contentious topic, particularly in educational contexts where it is not yet openly implemented. Because of the COVID-19 pandemic, the transition to online learning has become an emergency reaction. According to the World Bank (2020), the worldwide outbreak led several countries around the world to develop remote learning methods, which were not always successful. According to Rodriguez et al. (2021), the availability of technology is required but not sufficient for effective remote learning, and so the impact of technology on education remains a challenge. Nonetheless, online learning is a convenient way to learn even when there is no face-to-face interaction between the teacher and the students. According to Cakiruglo (2014), several universities provide online courses in order to supplement their teaching approaches with distance learning courses that address the different distance and time needs of today's learners. Regardless, students' learning styles should be considered in order for online learning to be more effective (Ching Gu et al., 2013).

In the Philippines, the Commission on Higher Education (CHED) established flexible learning by Memorandum Order No. 04, series of 2020, albeit its complete implementation varies by location. According to the Southeast Asian Ministers of Education Organization (SEAMEO), even though this mode of learning uses distance education and education technology, it varies depending on the levels of technology, availability of devices, internet connectivity, level of digital literacy, and approaches.

Furthermore, it is intended for the delivery of programs, courses, and learning interventions that address the unique needs of learners in terms of place, pace, process, and learning products. It addresses the application of digital and non-digital technologies in both face-to-face or in-person learning contexts as well as out-of-classroom learning modes of delivery or a mix of modes of delivery. According to Bennett and Neff (2018), online courses will appear more engaging if there is a combined variety of resources that appeal to many learning styles and offer different ways to learn. It will be useful to know the students' perceptions of the effectiveness of its implementation and how it relates to their learning styles.

Along these lines, the researcher argues that the students' perspective of online learning is crucial if it aligns with their learning patterns. As one of the institution's primary actors, the perception of learners immersed in online learning will aid in its improvement, particularly in terms of implementation. As a result, the researcher aims to know if the students' perception is significantly influenced by their learning styles, because, according to Zapalska and Brozik (2006), the achievement of online learning can be improved by providing instruction in a manner consistent with each student's learning style.

2. METHODOLOGY

The current study relied heavily on quantitative methods, notably a correlational research design, to investigate the relationship between students' learning styles and their attitudes about online learning. An electronic survey and an

online VARK questionnaire were used to obtain data about the effectiveness and relative advantages of online learning. The study's participants included 100 education students enrolled in a state university in the Philippines. In order to acquire the necessary data, an electronic survey questionnaire was used in this research investigation. The questionnaire is made up of two parts: (a) a VARK questionnaire to determine the students' learning styles, and (b) a questionnaire regarding the students' attitudes about online learning. Finally, the chi-square test and cross-tabulations were used to determine whether or not there is a significant relationship between the students' learning styles and their perceptions of online learning. The mean and standard deviation were also utilized to represent the respondents' perceptions of online learning based on their learning styles. All statistical analyses were carried out using Microsoft Excel and the Statistical Package for Social Sciences (SPSS) software.

3. RESULTS AND DISCUSSION

Respondent's Learning Styles

Table 1. Students' VARK Learning Style

Learning Style	Frequency (f)	Percentage (%)
Multimodal (VARK)	30	30.00%
Multimodal (ARK)	11	11.00%
Mild Kinesthetic	9	9.00%
Mild Read/Write	6	6.00%
Strong Kinesthetic	6	6.00%
Very Strong Kinesthetic	5	5.00%
Multimodal (AK)	5	5.00%
Mild Aural	4	4.00%
Strong Read/Write	4	4.00%
Multimodal (VRK)	4	4.00%
Multimodal (VK)	4	4.00%
Mild Visual	3	3.00%
Multimodal (VAK)	3	3.00%
Multimodal (VR)	3	3.00%
Multimodal (RK)	3	3.00%
Total	100	100.00%

Table 1 shows the VARK learning styles of the respondents. It can be gleaned from the analysis that there are 15 learning styles identified among the 100 respondents. The data reveals that the majority, or 30%, of the respondents have multimodal (VARK) learning styles. This reflects that the respondents have varied learning styles, and therefore these differences in terms of learning styles need to be properly addressed in order for them to be provided with meaningful teaching and learning experiences. Moreover, the data also reveals that there are 11% in the Multimodal (ARK), 9% are Mild Kinesthetic, 6% belong to both Mild Read/Write and Strong Kinesthetic learning styles, 5% belong to both Very Strong Kinesthetic and Multimodal (AK) learning styles, 4% belong to Mild Aural, Strong Read/Write, Multimodal (VRK), Multimodal (VK), and 1 or 1.6% of the respondents are Mild Visual, Multimodal (VAK), Multimodal (VR), and Multimodal (RK) learning styles.

It was stressed by VARK Learn Limited online (2021) that it is not appropriate to just choose the modality with the highest score, as most people have a multimodal learning preference, thus the present study has presented the varied multimodal learning styles of the respondents. Furthermore, Atkinson (2017) said that the identification of multimodal learning styles of the students balances the scale for the use of learning preferences among students to understand themselves as learners and increases self-awareness. Moreover, learning styles, increase self-esteem, learning effectiveness, motivation, and even retention, giving learners a locus of control in educational environments. Using these styles, students may even morph an inactive learning situation into a more active and engaging opportunity (Wood, 2017).

Respondents' Perception towards Online Learning

Table 2. Students' Perception of online learning

Indicators	Mean	Adjectival Rating
The same amount of learning can be acquired online and through traditional learning modalities.	2.87	Undecided
Learning is better in courses using online learning modality as compared to the traditional one.	2.47	Disagree
Online learning is preferable for students.	2.49	Disagree
Online learning is more effective than traditional methodologies e.g., face to face learning.	1.97	Disagree

The same grades can be attained by students online and through traditional learning modalities.	2.70	Undecided
Online learning enables better attendance to classes as compared to traditional learning.	2.78	Undecided
Learning is more conducive through online material provided in an online learning modality.	2.95	Undecided
Taking courses online feels more comfortable.	2.68	Undecided
Online learning provides students to be more flexible in their schedules.	3.85	Agree
Online learning saves a lot of time, effort, and resources.	3.78	Agree

Table 2 shows students' attitudes toward online learning. Students agree that online learning gives them greater schedule flexibility, with a mean of 3.85 and a standard deviation of 0.68, and that it saves them a lot of time, effort, and resources, with a mean of 3.78 and a standard deviation of 0.55. Students, on the other hand, disagree with the following indicators: that online learning is superior to traditional learning with a mean of 2.47 and a standard deviation of 1.23; that online learning is preferable for students with a mean of 2.49 and a standard deviation of 1.07; and that lessons can be understood better with a mean of 1.97 and a standard deviation of 1.12.

Meanwhile, students are undecided about the following indicators: (1) the same amount of learning can be acquired online and through traditional learning modalities with a mean of 2.87 and standard deviation of 1.53; (2) the same grades can be attained by students online and through traditional learning modalities with a mean of 2.70 and standard deviation of 0.87; (3) that online learning enables better attendance to classes as compared to traditional learning with a mean of 2.78 and standard deviation of 0.67; (4) learning would be effective online when there are materials provided with a mean of 2.95 and standard deviation of 0.86; (5) taking courses online feels more comfortable with a mean of 2.68 and standard deviation of 1.12.

These findings can be supported by what Umm Al-Qura University Agency (2020) has conducted on the comparison of online versus traditional learning. As a result, the conventional methods of instruction in the "learning skills" course were observed, in which the content is presented to all students in one style that is dependent on understanding the content regardless of the diversity of their learning styles.

This "one-style-fits-all" approach implies that all learners are expected to use the same learning style as prescribed by the e-learning environment. This is an indication that learners have different perceptions of online learning because of their learning styles particularly since the whole world was exposed to online learning, however, it cannot be denied that there is an adjustment on the part of students. Furthermore, Belanger and Jordan (2000) reported three ways in which the technologies may be employed in educational organizations as they evolve through stages. The first stage is technology insertion, which happens when the organization is interested in using instructional technologies within the traditional classroom environment. The second stage is partial conversion, in which parts of courses are delivered online or through other distance-learning technologies. The third stage is total conversion, which is the most extensive conversion of traditional classroom training to online or other distance-learning technologies. Students may have different perspectives about online learning based on their experience.

Table 3. a Students' perceptions about the amount of learning acquired online and in traditional learning modality

Learning Styles	N	Mean	SD	Adjectival Rating
<i>Statement 1. The same amount of learning can be acquired online and through traditional learning modalities.</i>				
Multimodal (VARK)	20	3.10	1.02	Undecided
Multimodal (ARK)	9	2.89	1.17	Undecided
Mild Kinesthetic	7	2.29	0.95	Disagree
Mild Read/Write	4	3.75	1.50	Agree
Strong Kinesthetic	4	3.25	0.96	Undecided
Very Strong Kinesthetic	3	2.67	1.15	Undecided
Multimodal (AK)	3	2.33	0.58	Disagree
Mild Aural	2	3.00	1.41	Undecided
Strong Read/Write	2	3.00	1.41	Undecided
Multimodal (VRK)	2	2.50	0.71	Disagree

Multimodal (VK)	2	1.50	0.71	Strongly Disagree
Mild Visual	1	5.00	.	Strongly Agree
Multimodal (VAK)	1	3.00	.	Undecided
Multimodal (VR)	1	2.00	.	Disagree
Multimodal (RK)	1	4.00	.	Agree

Table 3.a revealed that the student with a Mild Visual learning style strongly agrees that the same amount of learning can be obtained through both online and traditional modalities. Students with Mild Read/Write (mean = 3.75; SD = 1.5) and Multimodal (RK) (mean = 4.0) learning styles also agree with the first statement.

On the other hand, students with a Multimodal (VK) learning style strongly disagree with the first statement as students with a preference for visual as well as kinesthetic, and at the same time prefers physical activities while seeing diagrams, charts, and other visual devices that are real as defined in the VARK Learn Limited (2021). Those with Mild Kinesthetic, Multimodal (AK), Multimodal (VARK), and Multimodal (VR) learning styles also do not believe that the same amount of learning can be obtained through online modality as in traditional face-to-face learning modality.

Table 3. b Students’ perceptions about the comparison between online learning and traditional learning modalities

Learning Styles	N	Mean	SD	Adjectival Rating
<i>Statement 2. Learning is better in courses using online learning modality as compared to the traditional one.</i>				
Multimodal (VARK)	20	2.65	0.93	Undecided
Multimodal (ARK)	9	2.67	1.00	Undecided
Mild Kinesthetic	7	2.43	0.98	Disagree
Mild Read/Write	4	3.00	1.41	Undecided
Strong Kinesthetic	4	3.00	0.82	Undecided

Very Strong Kinesthetic	3	2.00	0.00	Disagree
Multimodal (AK)	3	2.00	0.00	Disagree
Mild Aural	2	2.50	0.71	Disagree
Strong Read/Write	2	3.00	1.41	Undecided
Multimodal (VRK)	2	2.50	0.71	Disagree
Multimodal (VK)	2	1.50	0.71	Strongly Disagree
Mild Visual	1	4.00	.	Agree
Multimodal (VAK)	1	2.00	.	Disagree
Multimodal (VR)	1	1.00	.	Strongly Disagree
Multimodal (RK)	1	2.00	.	Disagree

The second statement “In a course both offered in online learning and traditional methodologies, I learn better through online learning”, is agreed upon by the student with Mild Visual learning style while those with Multimodal (VK) (mean = 1.5; SD = 0.71) and Multimodal (VR) learning styles disagree strongly with the statement. This could be explained by the mild visual learners prefer gathering information through visuals and diagrams which online learning mostly provides and could make them agree that online learning is better than traditional one. Meanwhile, those with strong learning styles of both visual and read/write prefer learning with a traditional modality as they might prefer different formats, graphs, diagrams, maps, interesting layouts, space, notes, handouts, print, and text in a traditional modality such as in a face-to-face context. It is also illustrated in Table 3. b that those with kinesthetic learning styles (Mild Kinesthetic, Very Strong Kinesthetic, Multimodal (AK, VRK, VAK, and RK) also do not agree that learning is better through online modalities.

Table 3. c Students’ perceptions about taking a course in an online learning modality

Learning Styles	N	Mean	SD	Adjectival Rating
-----------------	---	------	----	-------------------

Statement 3. Online learning is preferable for students.				
Multimodal (VARK)	20	2.65	1.18	Undecided
Multimodal (ARK)	9	2.78	0.97	Undecided
Mild Kinesthetic	7	2.86	0.90	Undecided
Mild Read/Write	4	3.50	1.73	Agree
Strong Kinesthetic	4	3.50	1.00	Agree
Very Strong Kinesthetic	3	2.00	0.00	Disagree
Multimodal (AK)	3	2.00	1.00	Disagree
Mild Aural	2	3.00	1.41	Undecided
Strong Read/Write	2	3.00	1.41	Undecided
Multimodal (VRK)	2	2.50	0.71	Disagree
Multimodal (VK)	2	2.50	0.71	Disagree
Mild Visual	1	4.00	.	Agree
Multimodal (VAK)	1	2.00	.	Disagree
Multimodal (VR)	1	1.00	.	Strongly Disagree
Multimodal (RK)	1	2.00	.	Disagree

Several students disagree with the third statement (Table 3. c). Specifically, students with Very Strong Kinesthetic and Multimodal (VAK, AK, VRK, VK, VAK, and RK) learning styles do not prefer to take courses through online learning modalities. Moreover, the student with a Multimodal (VR) learning style strongly disagrees with the statement. However, students with Mild Read/Write, Strong Kinesthetic, and Mild Visual learning styles agree with the third statement. It may be odd that Strong Kinesthetic learners prefer to take online courses but, in the study conducted by Wood & Sereni-Massinger (2016), they found that initiating active learning strategies in an online environment using critical thinking activities, replication of real-life experiences,

simulations, interactive technology, and gaming interfaces allowed Kinesthetic learners to engage, receive hands-on perspective, and immersed themselves in experience.

Table 3.d Students’ perceptions about the comparison of the effectiveness between online learning and face-to-face learning

Learning Styles	N	Mean	SD	Adjectival Rating
Statement 4. Online learning is more effective than traditional methodologies e.g. face to face learning.				
Multimodal (VARK)	20	2.40	0.94	Disagree
Multimodal (ARK)	9	2.33	0.71	Disagree
Mild Kinesthetic	7	2.00	1.00	Disagree
Mild Read/Write	4	2.25	0.50	Disagree
Strong Kinesthetic	4	2.75	0.50	Undecided
Very Strong Kinesthetic	3	2.00	0.00	Disagree
Multimodal (AK)	3	1.67	0.58	Strongly Disagree
Mild Aural	2	2.00	0.00	Disagree
Strong Read/Write	2	1.50	0.71	Strongly Disagree
Multimodal (VRK)	2	2.00	0.00	Disagree
Multimodal (VK)	2	2.00	0.00	Disagree
Mild Visual	1	2.00	.	Disagree
Multimodal (VAK)	1	3.00	.	Undecided
Multimodal (VR)	1	2.00	.	Disagree
Multimodal (RK)	1	2.00	.	Disagree

The vast majority of students, regardless of their learning style, disagree with the fourth statement, which indicates that students do not regard online learning modalities to be as effective as traditional methods (Table 3.d). This perception from most of the students can be explained by the technology acceptance model (TAM) wherein which defines attitude as the positive or negative feeling about a technology (e-learning) that is based on perceptions or experience (Davis et al. 1989; Taylor & Todd 1995). The model also implies that attitude towards usage is the positive or the negative feeling of a student towards e-learning, which influences their future reaction and behavioral intention to use e-learning. Hence, the attitude of disagreement of the students about online learning which is based on their perception is influenced by their experience in using online learning.

As cited in the study of Makarova (2021), students' perceptions about online learning are affected by the difficulties they face in online education which are laziness, inability to focus on the process of learning, poor quality of internet connection, the growing amount of homework in comparison to traditional learning, difficulties in material perception, lack of teacher-student communication, and absence of possibility to ask their teacher a question. Furthermore, Thompson (2021) said that there are classic disadvantages of online learning that center around technical problems. Nothing disrupts an online lesson more than audio, video, or connection issues such as the case of the Philippines where there are still places where internet connection is a factor in joining online classes.

Table 3. e Students' perceptions about the comparison with grades that can be attained online and in traditional learning modalities

Learning Styles	N	Mean	SD	Adjectival Rating
<i>Statement 5. The same grades can be attained by students online and through traditional learning modalities.</i>				
Multimodal (VARK)	20	2.60	1.10	Disagree
Multimodal (ARK)	9	3.56	0.73	Agree
Mild Kinesthetic	7	2.57	1.13	Disagree
Mild Read/Write	4	3.00	1.41	Undecided
Strong Kinesthetic	4	3.50	1.00	Undecided

Very Strong Kinesthetic	3	3.00	1.00	Undecided
Multimodal (AK)	3	3.67	0.58	Agree
Mild Aural	2	3.50	0.71	Agree
Strong Read/Write	2	2.00	0.00	Disagree
Multimodal (VRK)	2	1.50	0.71	Strongly Disagree
Multimodal (VK)	2	2.00	0.00	Disagree
Mild Visual	1	2.00	.	Disagree
Multimodal (VAK)	1	3.00	.	Undecided
Multimodal (VR)	1	1.00	.	Strongly Disagree
Multimodal (RK)	1	5.00	.	Strongly Agree

The last statement that states that the same grades can be attained by students online and through traditional learning modalities was strongly agreed upon by the student with a Multimodal (RK) learning style; and agreed upon by those with Multimodal (ARK), Multimodal (AK), and Mild Aural. On the other hand, there were groups who disagreed with the statement mentioned such as Multimodal (VARK), Mild Kinesthetic, Strong Read/ Write, Multimodal (VK), and Mild Visual with the same mean of 2.00 and standard deviation of 0.00). The groups of Multimodal (VRK) with a mean of 1.50 (and standard deviation of 0.71) and Multimodal (VR) with a mean of 1.00 strongly disagree with the given statement.

Ennouammani (2017) said that it will take time for the community to embrace online learning while considering a lot of factors such as gadgets ownership, stability of internet connection, and acquiring technological skills of students and teachers. On the other hand, while student engagement has become a central issue in learning, it is also an indicator of educational quality and whether active learning occurs in classes. Veiga et al. (2014) suggest that there is a need for further research on engagement because assessing students' engagement is a predictor of learning and academic progress.

Table 4. Correlation Analysis between Students' Perceptions of Online Learning and their Learning Styles

Variables	Contingency Coefficient	Sig. V
-----------	-------------------------	--------

Students' Perceptions of Online Learning * VARK Learning Styles	0.933	0.023 learning modality. These findings are supported by research undertaken by Umm Al-Qura University Agency (2020) comparing online with traditional learning. The findings indicate that traditional methods of instruction in the "learning skills" course were observed, in which the content is delivered to all students in one style that is dependent on understanding the subject regardless of their learning styles' diversity. This "one-style-fits-all" approach means that all learners are required to utilize the same learning style that the e-learning environment has prescribed. This obviously illustrates that learners have various impressions of online learning according to their learning styles, especially since the entire world has been exposed to online learning; nonetheless, it cannot be denied that students have adjusted.
---	-------	---

$\alpha=0.05$ Level of Significance

Table 5 reveals that the null hypothesis is rejected. The correlation coefficient suggests that the two variables have a very strong positive association. Similar findings were found in Baherimoghdam's (2022) study on learning styles and student satisfaction with eLearning activities, where he explained that students today are electronic multitaskers, a dependent generation, and are extremely adaptable to new technology, and that there is more than one body's sense involved when dealing with activities. Thus, Tahere (2022) confirmed that students have a variety of learning styles that correspond to their perception of the use of online learning. In addition to that, Ac (2018) also asserted that the presence of various learning styles is related to the different abilities and individual preferences of students to learn. Moreover, the impact of learning style on the academic performance of students has been previously verified by the studies of Akhlaghi (2018) and Ilcin (2018).

4. CONCLUSIONS AND RECOMMENDATIONS

The current study's findings demonstrated that students' perceptions of online learning are influenced by their learning styles. As a result, there is a strong link between students' learning styles and their attitudes toward online learning. Among the 100 respondents, this study identified 15 learning styles: Multimodal (VARK), Multimodal (ARK), Mild Kinesthetic, Mild Read/Write, Strong Kinesthetic, Very Strong Kinesthetic, Multimodal AK), Mild Aural, Strong Read/Write, Multimodal (VRK), Multimodal (VK), Mild Visual, Multimodal (VAK), Multimodal (VR), and Multimodal (RK). Because the majority of students are multimodal, the VARK Learn Limited online (2021) stressed that it is not appropriate to simply choose the modality with the highest score, as the majority of people have a multimodal learning preference, the current study has presented the respondents' varied multimodal learning styles. According to Atkinson (2017), the identification of multimodal learning styles of students balances the scale for the use of learning preferences among students to understand themselves as learners and enhances self-awareness.

The current study additionally revealed that students' perceptions of perceived learning effectiveness and perceived relative advantages of online learning differ. Students agree that online learning gives them more flexibility in their schedules and saves them a lot of time, effort, and resources, but they disagree with the following indicators: (1) that learning is better in online learning courses than in traditional ones; (2) that online learning is preferable for students; and (3) that lessons can be understood better by using the online

Overall, because this study identified the students' learning styles, which have a very strong positive relationship with their perceptions of the effectiveness and relative advantages of online learning, online learning should be improved by providing instruction as well as the overall implementation of online education in a manner consistent with each student's learning style, as suggested by Zapalska and Brozik (2006). Furthermore, Ching Gu et al. (2013) stated that the students' learning styles should be considered for online learning to be more effective. Finally, the study discovered that most of the students are undecided and in some cases, they even disagree, and that there should be an improvement with its implementation, so present suggestions for future research and recommendations are made.

5. REFERENCES

[1] Abu Mansor, M., & Ismail, A. (2012). Learning Styles and Perception of Engineering Students Towards Online Learning. *Procedia - Social And Behavioral Sciences*, 69, 669-674. Retrieved from: <https://doi.org/https://doi.org/10.1016/j.sbspro.2012.11.459>.

[2] Abbasi, S., Ayoob, T., Malik, A., & Memon, S. I. (2020). Perceptions of students regarding E-learning during Covid-19 at a private medical college. *Pakistan journal of medical sciences*,36(COVID19-S4),S57–S61.

[3] Akhlaghi N, Mirkazemi H, Jafarzade M, Akhlaghi N. Does learning style preferences influence academic performance among dental students in Isfahan, Iran? *J Educ Eval Health Prof.* 2018;15:8.

[4] Atkinson, T. (2017). Strengths and Weaknesses in Learning Styles. *Paving the Way of Lifelong Learning By Examples.* Retrieved on 30 October 2022 at <https://tracyharringtonatkinson.com/strengths-weaknesses-learning-styles/>

[5] Avila1, E., Abin1, G., Bien1, G., Acasamoso, D., & Arenque1, D. (2021). Students' Perception on Online and Distance Learning and their Motivation and Learning Strategies in using Educational Technologies during COVID-19 Pandemic. *Journal Of Physics: Conference*

- Series. <https://doi.org/doi:10.1088/1742-6596/1933/1/012130>
- [6] Baherimoghdam, T., Hamedani, S., mehrabi, M. et al. The effect of learning style and general self-efficacy on satisfaction of e-Learning in dental students. *BMC Med Educ* 21, 463 (2021). <https://doi.org/10.1186/s12909-021-02903-5>
- [7] Bali, S., & Liu, M. (2018). Students' perceptions toward online learning and face-to-face learning courses. *Journal Of Physics: Conference Series*, 1108. <https://doi.org/1108 012094>
- [8] Bangcola, A. (2016). Learning Styles as Predictor of Academic Performance in the Nursing Department of an Asian University and Colleges. *International Journal of Learning, Teaching And Educational Research*, 15(4). Retrieved 10 November 2021, from <https://www.ijlter.org/index.php/ijlter/article/view/666>.
- [9] Belanger & Jordan (2000) Belanger, F., & Jordan, D. H. (2000). Evaluation and implementation of distance learning: Technologies, tools and techniques. Hershey, P. A.: Idea Group Pub.
- [10] Belgica, C., Calugan, J., Dumo, J., & Simber, L. (2020). Online Distance Learning: Thematic Study on the Challenges Faced By Educare College Inc. Primary Pupils. University of the Cordilleras, Baguio City, Benguet, Philippines.
- [11] Bennett, A. (2018). How online courses appeal to different learning styles [Blog]. Retrieved 15 November 2021, from <https://www.marian.edu/academics/marian's-adult-programs/online-and-/2018/08/20/how-online-courses-appeal-to-different-learning-styles>.
- [12] Brumini G, Spalj S, Mavrinac M, Biočina-Lukenda D, Strujić M, Brumini M. (2014). Attitudes towards e-learning amongst dental students at the universities in Croatia. *European journal of dental education: official journal of the Association for Dental Education in Europe*. 18(1):15–23.
- [13] Cambridge Dictionary, (.n.d). Correspondence Course. Retrieved from: <https://dictionary.cambridge.org/us/dictionary/english/correspondence-course>
- [14] Çakıroğlu, Ü. (2014). Analyzing the Effect of Learning Styles and Study Habits of Distance Learners on Learning Performances: A Case of an Introductory Programming Course. *The International Review Of Research In Open And Distance Learning*, 15(4). Retrieved 4 November 2021, from <https://files.eric.ed.gov/fulltext/EJ1039811.pdf>.
- [15] Commission on Higher Education. (2020). Guidelines on the Implementation of Flexible Learning. Quezon City.
- [16] Curelaru, M., Curelalu, V., & Cristea, M. (2022). Students' Perceptions of Online Learning during COVID-19 Pandemic: A Qualitative Approach. *MDPI sustainability*, 3.
- [17] Davis, L., 2020. Digital Learning: What to Know in 2020. [online] Schoology.com. Available at: <https://www.schoology.com/blog/digital-learning> [Accessed 4 December 2021].
- [18] Dayon, C. (2018). Learning Styles and Academic Performance of Students in English 3. *International Peer Reviewed Journal*, 2. <https://doi.org/ONLINE ISSN: 2619-8436>
- [19] Debroy, A. (2017). Countries Which are Leading the Way in Online Education. Retrieved from <https://edtechreview.in/e-learning/3028-countries-leading-in-online-education>
- [20] Desai, A. (.n.d). Are distance learning, are online learning and e-learning the same? Retrieved From: <https://www.indiaeducation.net/online-education/articles/are-distance-learning-online-learning-and-e-learning-the-same.html>
- [21] Diaz, D., & Cartnal, R. (1999). Students' Learning Styles in Two Classes: Online Distance Learning and Equivalent On-Campus. Taylor & Francis, Ltd., 47(No. 4 (Fall, 1999), pp. 130-135. Retrieved 19 October 2021, from <http://www.jstor.org/stable/27558962>
- [22] Ennouamani, S., & Mahani, Z. (2017). An overview of adaptive e-learning systems. Eighth International Conference on Intelligent Computing and Information Systems (ICICIS). <https://doi.org/10.1109/INTELCIS.2017.8260060>.
- [23] Fleming, N., and Baume, D. (2006) Learning Styles Again: VARKing up the right tree!, *Educational Developments*, SEDA Ltd, Issue 7.4, Nov. 2006, p4-7.
- [24] İlçin N, Tomruk M, Yeşilyaprak SS, Karadibak D, Savcı S. The relationship between learning styles and academic performance in Turkish physiotherapy students. *BMC medical education*. 2018;18(1):291. International Bureau of Education (.n.d). Learning Styles. Retrieved from <http://www.ibe.unesco.org/en/glossary-curriculum-terminology/l/learning-styles>
- [25] Kumiawan, R. (2015). Student's Perception. Retrieved from <http://repository.ump.ac.id/67/3/Rizky%20CHAPTER%20II.pdf>
- [26] Li, C., & Lalani, F. (2020). The COVID-19 pandemic has changed education forever. This is how. *World Economic Forum*. Retrieved 23 November 2021, from <https://www.weforum.org/agenda/2020/04/coronavirus-education-global-covid19-online-digital-learning/>.
- [27] Makarova, E. (2021). Effectiveness of traditional and online learning: comparative analysis from student perspective. *EDP Sciences*.
- [28] Meyer, D., 2020. Virtual Learning Is the Way Forward for Educators. [online] Available at: <https://www.elmhurst.edu/blog/virtual-learning/> [Accessed 4 December 2021].

- [29] Ministry of Education. (2006a). ICT strategic framework for education 2006–2007. Wellington, New Zealand: Author. Retrieved from <http://www.minedu.govt.nz/~media/MinEdu/Files/EducationSectors/PrimarySecondary/Initiatives/ICTStrategy/ICTStrategicFrameworkEducation.pdf>.
- [30] Nair, m. Facts: Is Online Learning As Good As Face-To-Face Learning?. University of the People. Retrieved 15 November 2021, from <https://www.uopeople.edu/blog/online-learning-good-as-face-to-face-learning/>.
- [31] Online Learning. (2021). What is online education? Retrieved from <https://www.indiaeducation.net/online-education/articles/what-is-online-education.html>
- [32] Peyman, H., Sadeghifar, J., Khajavikhan, J., Yasemi, M., Rasool, M., Yaghoubi, Y. M., Nahal, M. M., & Karim, H. (2014). Using VARK Approach for Assessing Preferred Learning Styles of First Year Medical Sciences Students: A Survey from Iran. *Journal of clinical and diagnostic research: JCDR*, 8(8), GC01–GC4. <https://doi.org/10.7860/JCDR/2014/8089.4667>
- [33] Pinchot, J., & Pullet, K. (2014). Different Keystrokes for Different Folks: Addressing Learning Styles in Online Education. *Information Systems Education Journal (ISEDJ)*, 12(2). <https://doi.org/ISSN: 1545-679X>
- [34] POP! Davis, L., 2020. Digital Learning: What to Know in 2020. [online] Schoology.com. Available at: <https://www.schoology.com/blog/digital-learning> [4 December 2021].
- [35] Powell, A., & Barbour, M. K. (2011). Tracing international differences in online learning development: An examination of government policies in New Zealand. *Journal of Open, Flexible and Distance Learning*, 15(1), 75–89.
- [36] Resources. (n.d.). Retrieved from Drexel University School of Education: <https://drexel.edu/soe/resources/student-teaching/advice/benefits-of-online-and-virtual-learning/>
- [37] Rotas, E. E., & Cahapay, M. B. (2020). Difficulties in Remote Learning: Voices of Philippine University Students in the Wake of COVID-19 Crisis. *Asian Journal of Distance Education*, 15(2), 147-158. <https://doi.org/10.5281/zenodo.4299835>
- [38] Sander, T. (2020). What is E-Learning? Retrieved from <https://e-student.org/what-is-e-learning>
- [39] Stafford Global, (2020). What’s the difference between Online Learning and Distance Learning? Retrieved from <https://www.staffordglobal.org/articles-and-blogs/whats-the-difference-between-online-and-distance-learning/>
- [40] Stern, J (n.d). Introduction to Online Teaching and Learning. Retrieved from <http://www.wlac.edu/online/documents/otl.pdf>
- [41] Thompson, S. (2021). Top 5 Advantages and Disadvantages of Online Classes For Higher Education. Kultura Website. Retrieved from <HTTPS://CORP.KALTURA.COM/BLOG/ADVANTAGES-DISADVANTAGES-ONLINE-CLASSES/>
- [42] Umm Al-Qura University Agency for Educational Affairs (2020). Common first-year Deanship, at Umm Al-Qura University. Retrieved February 3, 2020 from <https://uqu.edu.sa/en/pre-edu/70021>
- [43] Veiga, F., Robu, V., Appleton, J., Festas, I & Galvao, D. (2014). Students' engagement in school: Analysis according to self-concept and grade level. *Proceedings of EDULEARN14 Conference 7th-9th July 2014* (pp. 7476-7484). Barcelona, Spain. Available Online at: <http://hdl.handle.net/10451/12044>.
- [44] VARK Modalities: what do Visual, Aural, Read/write & Kinesthetic really mean? (2021). Retrieved from VARK Learn Limited: <https://vark-learn.com/introduction-to-vark/the-vark-modalities/>
- [45] Virtual College, (n.d). What is e-learning? Retrieved from <https://www.virtual-college.co.uk/faqs/bespoke/what-is-e-learning>.
- [46] Wood, D. (2017). Reasons to Incorporate Learning Styles in Teaching. Retrieved from <http://study.com/academy/lesson/reasons-to-incorporate-learning-styles-in-teaching.html>.
- [47] Writers, S. The History of Online Schooling. OnlineSchools.org. Retrieved 12 December 2021, from <https://www.onlineschools.org/visual-academy/the-history-of-online-schooling/>.
- [48] Zapalska, A., & Brozik, D. (2006). Learning styles and online education. *Emerald Group Publishing Limited*, 23(5), 325-335.1065-0741. DOI 10.1108/10650740610714080