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Kinesthetic Learners During the COVID-19 Pandemic in School going Students: A Perspective on E-learning

Mohammad Shadab Ameer[1], Sheeba Parveen[2]

[1]Occupational Therapist (MOT Paediatrics), [2]Assistant Professor, Department of Occupational Therapy, Jamia Hamdard, New Delhi 110062, India.

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Abstract

Background: During the pandemic, because of the sudden transition in content delivery methods, students needed to quickly adapt to e-learning. Depending on their learning styles, student adaptation may have been challenging. The way a person learns is defined by their perceptions, processes, and preferences. To date, only a limited amount of research has been done on the relationship between attitudes toward e-learning and learning styles. Because kinesthetic learners prefer hands-on learning, students may have found the transition to e-learning difficult. Therefore, the purpose of this study was to screen and gain the perspective of kinesthetic learners in the online learning environment.

Aim: This study aimed to screen and gain the perspective of kinesthetic learners among school-going students in an online learning environment.

Procedure: This study included 100 school-going students from South Delhi, participants were sent google forms, and an online link to fill VARK questionnaire after being informed of the study's objectives and signing an informed consent form.

Results: After screening using VARK 18% of subjects were categorized as kinesthetic learners whose mean age was 15.39 years $\pm$ 2.062, however, the range remained the same as 6 with a minimum ranging from 12 years to a maximum of 18 years of age. Six open-ended questions were then given to 18 participants to collect qualitative data.

Conclusion: The results of this study suggested that Kinesthetic learners' perspective

on e-learning is that they revealed decreased levels of confidence in the content learned during e-learning during the pandemic. The evidence from our study gave a call for attention to the teachers during the pandemic for the kinesthetic learners in the online learning environment.

Key Words: Kinesthetic learners, E-learning, COVID-19, Occupational Therapy

Introduction

COVID-19 is an infectious respiratory disease that is spread between individuals mostly through viral transmission[1]. Due to the pandemic, the spring 2020 semester had a huge impact on school systems all over the world, and it raised a lot of questions about

Corresponding Author: Sheeba Parveen. Assistant Professor, Department of Occupational Therapy, Jamia Hamdard, New Delhi 110062, India.

Email id: shadabameer@gmail.com

the future of education in both virtual and in-person formats[2]. The shift from face-to-face to online learning has highlighted the vast disparities in educational outcomes between and within states. Teachers' capacity, learning outcomes, government-provided digital infrastructure, and access to technology all show inequalities. The AAC (Alternative Academic Calendar) assumes that Indian states have created digital ecosystems in which all teachers and students have seamless internet and smartphone access (United Nations Children's Fund (UNICEF) and United Nations Educational, Scientific and Cultural Organization (UNESCO), 2021 [3]. E-learning is an educational method that teaches people to use virtual technologies [4]. Web-based education, online social software, internet video conferencing, and computer-assisted instruction are all instances of e-learning. Because of the sudden transition in content delivery methods, students needed to quickly adapt to e-learning. Depending on their learning styles, student adaptation may have been challenging. The way a person learns is defined by their perceptions, processes, and preferences [5]. To date, only a limited amount of research has been done on the relationship between attitudes toward e-learning and learning styles [6]. The VARK model is a sensory preference and learning processing model [7], Visual learners, auditory learners, kinesthetic learners, and reading/writing learners are the four types of learners identified [8].

Kinaesthetic learners prefer tactile input to writing, visual, or auditory input; they learn best by doing tasks and physically experiencing the material[9]. Because kinaesthetic learners prefer hands-on learning, students may have found the transition to e-learning difficult. Therefore, the purpose of this study was to screen and gain the perspective of kinaesthetic learners in the online learning environment. More specifically, the objective was to explore viewpoints and adaptations of kinaesthetic learners during the transition from a traditional classroom setting to e-learning.

E-learning

Online learning can be considered a tool for making the teaching-learning process more student-centered, innovative, and flexible. Another domain where there has been a significant shift to online transactions is education [10]. Schools, colleges, and universities all over the world have managed to switch to video conferencing platforms like Zoom and Google Meet since the lockdown began. Along with these synchronous modes of instruction, asynchronous platforms such as edX and Coursera have seen increased enrolees [11]. There are numerous technologies available for online education, but they can sometimes cause significant problems. The difficulties and problems associated with modern technology include download errors, installation issues, login issues, audio and video issues, and so on. Students must practice what they learn before the learning process can reach its full potential. Online content can sometimes be too theoretical for students to practice and learn effectively [12].

VARK Model

The VARK model identified four distinct learning styles: visual (V), auditory (A), read/write (R), and kinesthetic (K), as well as multimodality (MM), which is a combination of any of the four [8]. The VARK inventory questionnaire is used across many disciplines to assess how people prefer to receive and deliver information [13-15].

Kinesthetic Learning and E-learning

Distance and noninteractivity were perceived as barriers to e-learning for kinesthetic learners; however, online education inspired creativity and critical thinking in students by encouraging students to create and connect new ideas to apply to a practical setting [16]. Kinesthetic learners benefit from hands-on learning opportunities, which may be limited due to the current global situation's virtual format.

Occupational Therapy and Kinesthetic Learning

When people with bodily-kinesthetic learning styles are allowed to use their tactile senses as well as fine and gross motor movement as part of the learning process, they learn more effectively. They frequently prefer direct contact with the subject matter. Students with a bodily-kinesthetic learning style understand and remember material better when they use it actively[17]. They may benefit from projects that require them to create displays and props that explain subject matter, such as shadow boxes, models, animations, or videos. They might enjoy making

a game to review information[18]. When kinesthetic learners are only required to read or listen to a lecture without the ability to manipulate an object or move, they perform poorly.

Methodology

Study design

The study design was a survey type, convenience sampling was used. The sample size was 100 school-going students from the community who have been selected based on the inclusion and exclusion criteria. Students between the ages of 12 and 18 and those classified as kinaesthetic learners met the criteria for inclusion. Students who are VISUAL, AUDITORY, READ/WRITE learners, and students with ages between 12 and 18 were taken into consideration as exclusion criteria. The screening has been analysed using VARK QUESTIONNAIRE which includes visual, auditory, read or write, and kinaesthetic questionnaires.

Ethical Consideration

The proposal was passed through the dissertation committee of the Department of Occupational Therapy and the Ethical committee of Jamia Hamdard before its implementation. No unnecessary harm was caused to the participants involved. No interference was done in the participant's academic curriculum. Participants' details were kept confidential. The data thus collected was used only for research purposes.

Protocol of Data Collection

The data was collected by an observer, and instruction was given to all the participants in the form of written consent. Students were sent google forms, obtaining a demographic and online link to fill VARK Questionnaire. Students whose learning preferences were kinesthetic were screened and included in the study. Data of Delhi's school-going students of age 12-18 years were taken. The data were collected within 4-6 months.

Procedure

Permission was taken from the dissertation and ethical committee from Jamia Hamdard. Prior Permission had been taken from the author of the scale used in the study. Written consent was taken from participants for participation in this study. Students were sent google forms to obtain the demographic and online link to fill VARK Questionnaire. Students whose learning preferences were kinesthetic were screened and included in the study. They had been asked open-ended questions. Data were analyzed and interpreted.

Data Analysis and Results

Descriptives All

Quantitative

The school-going students were screened through The VARK Questionnaire for Younger People. When they were screened as Kinesthetic learners, they were asked open-ended questions to see the perspective of e-learning.

A total of 100 subjects were screened out with a mean age of 15.97 years $\pm$ 1.743 and a range of 6 years (minimum 12 years and Maximum 18 years).

Table 1: Statistics Data of all subjects

		Age in Years
N	Valid	100
	Missing	0
Mean		15.97
Median		16.00
Std. Deviation		1.743
Minimum		12
Maximum		18

Table 2. Gender Distribution

		Frequency	Percent
Valid	Male	72	72.0
	Female	28	28.0
	Total	100	100.0

The total subjects screened were 72% males and 28% females.

Table 3. VARK Score

	N	Minimum	Maximum	Mean	Std. Deviation
VARK Visual Score	100	0	12	4.88	2.618
VARK Aural Score	100	0	14	5.21	2.935
VARK Read/Write Score	100	0	12	4.87	2.926
VARK Kinesthetic Score	100	1	13	6.17	3.312
Valid N (listwise)	100				

The VARK Questionnaire for Younger People was used to screen out the kinesthetic learners from others, with a mean kinesthetic score of 6.17+-3.312 of all the 100 subjects who were screened.

Statistics

Table 4: Statistics of Kinesthetic learners

		Age in Years	VARK Visual Score	VARK Aural Score	VARK Read/ Write Score	VARK Kinesthetic Score
N	Valid	18	18	18	18	18
	Missing	0	0	0	0	0
Mean		15.39	2.28	2.11	1.61	10.50
Median		15.50	2.00	2.00	.50	11.50
Std. Deviation		2.062	.669	1.231	2.118	2.383
Minimum		12	1	1	0	6
Maximum		18	4	5	7	13

After screening using VARK 18% of subjects were categorized as kinesthetic learners whose mean age was 15.39 years $\pm$ 2.062, however, the range remained the same as 6 with a minimum ranging from 12 years to a maximum of 18 years of age. Whilst the VARK kinesthetic score ranged from a minimum of 6 to a maximum of 13 with a mean value (of 10.50 +- 2.383).

Qualitative

These 18 subjects were then provided with 6 Open-ended questions which are as follows. The frequency distribution of these questions is as follows.

Q1. When you heard there was going to be a transition to e-learning, what were your initial thoughts?

Responses: 67% of the subjects said they initially found the idea of e-learning challenging, while 6% said they found it interesting, simple, and exciting, and another 6% said they felt nervous about it.

Q2. How did teachers adapt their teaching style to facilitate effective e-learning?

Responses: All subjects agreed without exception that teachers did their very best and put forth a lot of preparation effort. Of these, 28% empathize with the reality of COVID-19 and acknowledge that during those trying times, they (teachers) were also learning alongside the students, and 44% of students came to the conclusion that they (teachers) should advance their technical infrastructure and knowledge.

Q3. What strategies did you have to personally use while adjusting to e-learning?

Responses: For a better understanding of the concepts, 33% of the subjects looked for online tutorials and videos, and about 17% looked for a quiet place to take classes. About 22% of students used self-learning techniques in addition to using textbooks, taking notes, and revising. While 11% adjusted their schedule to cut back on their time spent in front of the screen.

Q4. What factors did you find to be beneficial or distracting regarding your ability to focus?

Responses: 22% of subjects agreed that they could attend classes remotely from any location

with the aid of technology and the availability of the necessary tools, and 22% said that the teachers' resources were readily available and that a wealth of materials (including but not limited to notes and Videos shared by teachers) were thought to be helpful to the students. While nearly 45% of students cited a lack of human interaction as a major drawback of e-learning, 56% of students cited a lack of practicals and no hands-on learning as the most detrimental aspects of e-learning. 33% of respondents name technical challenges like network problems, audio and video problems, and on-screen time as the biggest drawbacks of e-learning. Furthermore, 11% said that outdoor noises and disturbances were major obstacles to online learning.

Q5. Were you able to implement any hands-on strategies ("Hands-on learning" refers to learning something by doing it rather than learning about it from books, lectures, or other sources) at home?

Responses: A little over 56% of students said they received no hands-on instruction during e-learning, regardless of the method the teacher used to demonstrate on video. A little over 30% of students learned new skills, such as drawing, typing, and making presentations, and they also had the chance to advance their technical knowledge of the various devices they were using.

Q6. What could your teachers do differently to facilitate more effective e-learning?

Responses: 83% of students believed that their teachers needed to develop their creative skills while conducting e-learning sessions, including using original artwork, explaining shared videos, and presenting in an engaging way that grabs students' attention. However, 11% of students desired that their teachers occasionally conduct offline sessions, for hands-on demonstrations or practicals but that was not possible during the pandemic.

Discussion

Visual, Aural, Read/Write, and Kinesthetic sensory modalities are used to learn information, and their abbreviation is VARK. Four modalities were proposed by Fleming and Mills (1992), and they appeared to reflect the experiences of the teachers and students [8]. When a diagram showing the relationships between various things is drawn on a whiteboard with meaningful symbols, it will be useful for people who prefer visual representations. Visual(V): This preference refers to the representation of the information through the use of maps, spider diagrams, charts, graphs, flow charts, labeled diagrams, and all other illustrative symbols such as arrows, circles, hierarchies, and other shapes that people employ to represent information that could have been presented verbally. Given that it more accurately describes what it covers, this mode should have been called Graphic (G). Aural(A): This perceptual mode refers to a preference for "heard or spoken" information. Students who rank this as their top preference claim that lectures, group discussions, radio, emails, using mobile phones, speaking, web-chat, and talking things through are the methods they learn from most effectively. Read/ Write(R): This preference is for the information presented as words. It should come as no surprise that this mode is preferred by many instructors and students. Employers look for graduates who have certain skills, including the ability to write well and read widely. This preference emphasizes text-based input and output, including manuals, reports, essays, and assignments, as well as reading and writing in general. Kinesthetic(K): This modality is defined as "a perceptual preference associated with the use of experience and practice (simulated or real)." The important thing is that those who prefer this mode are connected to reality, "either through concrete personal experiences, examples, practice, or simulation," even though such an experience may inspire other modalities [8]. Along with case studies, practice exercises, and applications, it also includes demonstrations, simulations, videos, and movies of "real" things.

The school-going students were screened through The VARK Questionnaire for Younger People. A total of 100 subjects were screened out with a mean age of 15.97 years $\pm$ 1.743 and a range of 6 years (minimum 12 years and Maximum 18 years). The Total subjects screened were 72% males and 28% females. The VARK Questionnaire for Younger People was used to screen out the kinesthetic learners from others, with a mean kinesthetic score of 6.17+-3.312 of all the 100 subjects

who were screened. After screening using VARK 18% of subjects were categorized as kinesthetic learners whose mean age was 15.39 years ± 2.062, however, the range remained the same as 6 with a minimum ranging from 12 years to a maximum of 18 years of age. Whilst VARK kinesthetic score ranged from a minimum of 6 to a maximum of 13 with a mean value (of 10.50 +- 2.383). There were 13 male and 5 female Kinesthetic learners. Kinesthetic learners prefer receiving information through tactile senses rather than writing, visual, or auditory input; they learn best by performing tasks and physically experiencing the material [9]. The distribution of learning preferences of the subjects was 61% multimodal, 18% Kinesthetic, 8% read/write and aural and just 5% Visual. The VARK model provides a quantification of the preferences of the students in each one of the four sensory modes [19]. Learning preference distribution of the subjects was categorized into 5 groups Visual learners, Aural Learners, Read/write learners, Kinesthetic learners, and Multimodal learners. Those who do not have a standout mode with one preference score well above other scores are defined as multimodal (https://vark-learn.com/introduction-to-vark/the-vark-modalities/).

E-learning is an educational method that uses virtual technologies to teach students [4]. This study was set to screen Kinesthetic learners among school-going students and to gain the perspective of kinesthetic learners in an online learning environment. Kinesthetic learners students were screened through The VARK Questionnaire for Younger People their people and their perspective was known by the open-ended questions. And based on the responses received I found that 67% of subjects reported initially it was tough, hard, and challenging to start with the thought of e-learning, while 6% reported it as interesting, easy, and exciting respectively and another 6% reported were nervous the same. 56% of students reported a lack of practicals and no hands-on learning was the most disadvantageous part of e-learning, while nearly, 45% of students reported a lack of human interaction as a major demerit of e-learning.

Conclusion

The results of this study suggested that Kinesthetic learners' perspective on e-learning is that they revealed decreased levels of confidence in the content learned during e-learning during the pandemic. Our results show that 18% of the study's participants were screened as kinesthetic and reported a challenging time. Hence, as occupational therapists working with these children, we are educator demonstrators, so we should emphasize learning by doing, especially for this group during e-learning during a pandemic. They should be provided complete demonstrations through recorded lectures when possible, during e-learning. The evidence from our study gave a call for attention to the teachers during the pandemic for the kinesthetic learners in the online learning environment.

Limitations

Due to the Covid-19 pandemic, convenience sampling was used in this study. The response rate of the survey represented a small percentage of school-going students which limits generalizability. A primary limitation of the survey instrument was that the researcher did not pilot the instrument or the screening tool.

Conflict of Interest: The authors report no conflicts of interest in this work.

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