ORIGINAL CONTRIBUTION

Motivation during Online Classes: Analyzing Socio-Demographic Profile of Engineering Students

Prof. Dr. Mohsin Kazmi [1*], Dr. Samar Fahd [2], Prof.® Dr. Muhmmad Saeed [3], Dr. Abdul Rauf [4], Syeda Sajida Firdos [5]

[1] Chemical, Polymer, and Composite Materials Engineering Department, University of Engineering and Technology, Lahore, Pakistan

[2] Assistant Professor, Department of Applied Psychology, The Islamia University of Bahawalpur, Pakistan

[3] Institute of Education & Research, University of the Punjab, Lahore, Pakistan

[4] Research Associate, PHEC Project No. PHEC/ARA/PIRCA/20534/23

[5] Ph.D Scholar, Department of Applied Psychology, The Islamia University of Bahawalpur, Pakistan

Abstract— The study aimed to analyze the socio-demographical profile of engineering students in the context of their motivation during online classes. Engineering students (N=1616) of both genders (males N=1352 & females N=264) enrolled in 9 public sector universities of Pakistan were included in this study. The age range of the students was between 17 to 26 years. The Academic Motivation Scale (Vallerand et al., 1992) and an extensive self-structured demographical profile were used as a tool for data collection. The Academic motivation scale measured seven sub-categories of intrinsic, extrinsic, and amotivation, while the demographical sheet collected different dimensions of the personal, educational, social, and residential information. The study gathered an enormous collection of information about significant demographics of engineering students studying through online classes. According to the perspective of gender, there was no significant difference found in the motivation level of students during online classes. Access to the internet was the most significant demographic variable, positively correlated with the sub-categories of intrinsic and extrinsic motivation during an online class. This study added a unique finding in the literature that students' motivation during online classes could be increased when they have better access to internet facilities.

Index Terms— Online classes, Motivation, Engineering students, Demographics
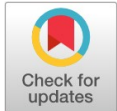
Introduction

Online learning is defined as the combination of distance education, the use of technological gadgets and the learner and instructor are geographically separate from each other (Hartnett, 2016). It was a less-known concept before the outbreak of the coronavirus. When the pandemic hit the world at the start of 2020, most educational activities shifted from conventional to online mode worldwide. For Pakistani students, the concept of online education was a new impression. Too many things affected the adaptation of this new mode

---

*Email: drkazmi@uet.edu.pk

of learning for students. The major drawback was the shortage of resources like the internet and the unaffordability of smart gadgets like laptops or smartphones, the socio-economic backgrounds of the students, their educational backgrounds, and most importantly, the motivation to learn online. A study conducted on 2160 students from public and engineering universities in Pakistan concluded through Technology Acceptance Model (TAM) that if the Government help in the development of IT infrastructure, technological support, and facilities in electronic resources, the attitude of students towards online learning can be improved (Rafiq, Hussain, & Abbas, 2020). Online mode could be a blessing for those students who do not face any socio-demographical hurdles; they find it easy and convenient to stay at home and start learning with just a finger. On the other hand, socio-demographical obstacles make learning almost impossible for students if the resources of online education are not affordable for a student due to any demographical reason like the economic condition of parents, remote areas of residence with less access to the internet, or the less exposure of online mode of education. Because, research witnessed that technological resources like mobile phones, laptops, good internet connection, and different types of online learning platforms (e.g. different communication software) are crucial to study online (Rafique, Mahmood, Warraich, & Rehman, 2021). Both of the above-mentioned scenarios are greatly affected by the one thing, which is student's motivation. For example, if a student has all the required facilities and is not motivated to learn, all the resources are useless for them. On the flip side, the less privileged but highly motivated students will try to find a way to learn out of their motivational intentions. Thus logically motivation and socio-demographical characteristics function side by side. Let me explain the mechanism of motivation here. The theoretical roots of motivation are found in the self-determination theory (Deci & Ryan, 1980). It is stated in self-determination theory that motivated behaviors are of two types, intrinsic or extrinsic consciously chosen behaviors are self-determined behaviors, and the other type is unconscious or automated behaviors. Automated behaviors need no involvement of the mind, e.g., nail biting or mechanical movement of a spoon from the plate to mouth. The development of self-development theory is continued (Adams, Little, & Ryan, 2017) as it expands from a narrow concept of intrinsic or extrinsic motivation to well-being, goals, and other areas of life. Self-determined behavior is a sequential process that starts with the input of information, the information is selected from the environment or the internal source based on one's significant needs. After the perception and organization of theses information, the people select the behaviors that can satisfy their motives (Deci & Ryan, 1980). Many psychological and cognitive outcomes are compulsory to survive in sociocultural circumstances, like motivation (Caleon et al., 2015), which is broadly described as the process of being "motivated to do something"(Ryan & Deci, 2000) and has been acknowledged as a vital aspect in promoting well-being. These motives can be further divided into intrinsic, extrinsic, and motivational. The distinction among these three categories is enumerated below:

Intrinsic motivation is characterized by the "Drive to pursue an activity solely for the pleasure or satisfaction obtained from it" (Fairchild, Horst, Finney, & Barron, 2005). The possible instinctive psychological demands, like self-determination and competence, gave rise to the concept of intrinsic motivation, further distinguished into more specific categories (Deci & Ryan, 1985, 1991). three easy to understand sub-categories of intrinsic motivation are listed below (Vallerand et al., 1992).

i. The first category is an intrinsic motivation to know, which can be explained as pleasure or satisfaction in exploring something new.

ii. The second category is intrinsic motivation, which is the pleasure or satisfaction of creating or accomplishing something new.

iii. The third category of intrinsic motivation is to experience stimulation, which is described as pleasure or satisfaction to experience fun or excitement.

Motivation is an important requirement for learners to involve in the learning process (Saeed & Zyngier, 2012). This study will address the connection between the student's motivation and the learning process. Furthermore, to the pandemic's current circumstances, this study will address the online learning process instead of the conventional classroom method. Extrinsic motivation progresses through a set of ordered categories, external regulation, introjected regulation, and identifiable regulation; it is becoming increasingly self-determined (Deci & Ryan, 2000). Externally regulated activities aim to achieve a favorable consequence or prevent an undesirable outcome. The term "introjected regulation" refers to actions that are controlled internally, such as studying to stave off guilt. In that the person does not place any personal value on the conduct, this concept is comparable to external regulation; nevertheless, it differs since it embodies a more autonomous kind of control. As opposed to identified regulation, which is still extrinsically motivated but differs in that it is characterized by full endorsement of action, identified regulation involves assigning personal worth to a behavior. Despite being comparable to intrinsically motivated behavior, this form of conduct is nevertheless driven by the value of the outcome rather than a purely intrinsic interest in the action (Deci, Vallerand, Pelletier, & Ryan, 1991). Motivation is different from the two types of motivation mentioned above, it is the state in which a person generally lacks the motivation to engage in an activity because they believe they are less competent or are unable to understand the importance of the action or its effects (Ryan & Deci, 2000). Researchers have found through component factor analysis that learner motivation, demographics, and academic issues emerged as related constructs among the sample of 141 students in the era of transition from conventional learning to E-learning (Aboagye, Yawson, & Appiah, 2021).

A lot of research have been conducted on the relativity of motivation during online learning and the significant demographics of the students, like age, gender, family, and many others (Aboagye et al., 2021; Cupitt & Golshan, 2015; Hartnett, 2016; Rizvi, Rienties, & Khoja, 2019). Many of the above-mentioned researches were conducted before the breakdown of Covid-19, which shows that the association between online education, motivation, and demographics of students was always a serious concern. The breakdown of the pandemic

made it more crucial. Many significant studies were conducted after the breakdown of the pandemic (Gabales et al., 2022; Harlow, 2022; Rosman, Rosli, Shukry, Razlan, & Alimin, 2022).

The present study focused on exploring the socio-demographic profile of engineering students during online classes in the context of the student's motivation. The study intended to ascertain the engineering student's motivation during online class and their demographic characteristics like their age, gender, marital and employment status, family and residential information, internet access, study hours per day, studied in government or private sector, and last but not the least question that whether they opted the field of engineering by choice or forcefully? The study also addressed the most crucial issue of the present pandemic: access to the internet. Most of the students in Pakistan do have an internet facility. Access to the internet and its relationship to the motivation level of engineering students during online classes is also a key assumption of this study.

Literature Review

Indeed, motivation is an essential ingredient of all the behaviors of human life; for example, if we look closely at the hierarchy of needs from the humanistic school of thought (Fallatah & Syed, 2018), it comes to our knowledge that every human behavior is motivated by some or other need to be satisfied. A human being is always motivated to move to the next stage of the hierarchy of needs step by step to achieve the highest level of self-actualization. During the recent pandemic since December 2019, the teaching and learning process is shifted to the online method from the conventional face-to-face method. The student's readiness and motivation to learn online was a major concern of the online learning era. Student's motivation during online classes was studied concerning different subjects, like motivation in the English language higher education students (Avila & Genio, 2020; Putra, 2021), readiness to study through online classes in Pakistani medical students (Rafique et al., 2021), and mathematics (Hwang, Wang, & Lai, 2021). But more literature was needed on the motivation level of Pakistani engineering students during online classes and rigorous analysis of their socio-demographic profile to highlight the significant demographic characteristics. Some international research is witnessed in the field of motivation and engineering students; for example, a study found that 82.2% of engineering students reported that a game-based online learning platform could increase their motivation in online learning (Mada & Anharudin, 2019). Another relevant study was conducted on 153 engineering students' online learning motivation and other variables like satisfaction with online classes and personality. The findings revealed that motivation strongly predicted satisfaction with online classes (Shih, Chen, Chen, & Wey, 2013). The present research will address a huge gap in the literature on the motivation and socio-demographic background of engineering students in Pakistan.

Method

A sample of N=1616 engineering students was recruited from 9 public sector universities of Punjab Pakistan (UET Lahore (70.2%), Punjab University Lahore (1.1%), KFUET Rahimyar Khan (3.1%), IUB Bahawalpur (1.5%), BZU Multan (5.8%), UET Texila (6.0%), University of Okara (4.5%), University of Gujrat (3.7%), MNU Multan (4.0%) through the convenient sampling method. Male (N=1352) and female (N=264) students in different engineering fields, ages between 17 to 26 years, were included in this study. The academic motivation scale (Vallerand et al., 1992), comprised of 28 items, was utilized to acquire the level of motivation among engineering students during online classes. The academic motivation scale known as AMS is translated into English from its French version (EME) (Vallerand, Blais, Brière, & Pelletier, 1989). It was a seven-point Likert scale containing questions about three main motivation factors: intrinsic, extrinsic, and motivation. These three factors are further divided into seven subscales:

Intrinsic motivation	**Extrinsic motivation**	
• To know	• Identified	
• Toward accomplishment	• Introjected	• Amotivation
• To experience stimulation	• External regulation	

This scale is modified for the engineering students before using it in this study. The Cronbach's Alpha for the modified version of AMS is reported as .91 in this study.

An extensive demographic information profile was constructed for this study, containing the information of students about their age, gender, marital and employment status, family system, birth order, number of siblings, parental income, education, profession and residential information, internet access, study hours per day, whether studied in government or privet sector and how they opted the field of engineering by choice or by force. It was a cross-sectional study, and the sample was acquired based on convenience. Data was collected online through Google forms. Confidentiality of the information was ensured, and consent for participation was taken before conducting the study.

Results

Tables and figures

Table I
Demographic profile of personal characteristics of engineering students (*N*=1616)

Characteristics	M	SD	f (%)
Gender	1.16	0.37	
Male			1352 (83.7)
Female			264 (16.3)
Age (in years)	20.69	1.36	
17			14 (0.9)
18			78 (4.8)
19			228 (14.1)
20			330 (20.4)
21			487 (30.1)
22			449 (27.8)
25			25 (1.5)
26			5 (0.3)

Table II
Demographic profile of social characteristics of engineering students (*N*=1616)

Characteristics	M	SD	f (%)
Area of Residence	1.40	0.49	
Urban			652 (40.3)
Rural			964 (59.7)
Family structure	1.55	0.49	
Joint			735 (45.5)
Nuclear			881 (54.5)
Siblings	4.05	1.58	
1			56 (3.5)
2			193 (11.9)
3			379 (23.5)
4			409 (25.3)
5			314 (19.4)
6			147 (9.1)
7			74 (4.6)
8			29 (1.8)
9			15 (0.90)
Birth order	2.55	1.49	
1			442 (27.4)
2			504 (31.2)
3			317 (19.6)
4			171 (10.6)
5			97 (6.0)
6			55 (3.4)
7			20 (1.2)
8			5 (0.3)
9			5 (0.3)
Marital status	1.02	0.13	
Married			1588 (98.3)
Unmarried			28 (1.7)
Access to internet	1.18	0.38	
Yes			1331 (82.4)
No			285 (17.6)
Employment status	1.92	0.26	
Yes			122 (7.5)
No			1494 (92.5)

Table III
Demographic profile of personal characteristics of engineering students (*N*=1616)

Characteristics	M	SD	f (%)
Schooling	1.51	0.50	
Government			789 (48.8)
Private			827 (51.2)
College	1.67	0.46	
Government			529 (32.7)
Private			1087 (67.3)
Academy	1.59	0.49	
Yes			657 (40.7)
No			959 (59.3)
Opted Engineering	1.11	0.31	
By choice			1435 (88.8)
By force			181 (11.2)
Studentship	1.50	0.50	
Day scholar			803 (49.7)
Resident of hostel			813 (50.3)
Hours spent on a study (per day)	2.12	0.97	
Less than 2 hours			510 (31.6)
2 to 4 hours			573 (35.5)
4 to 6 hours			364 (22.5)
6 to 8 hours			169 (10.5)
Semester	3.27	1.02	
2nd			25 (1.5)
3rd			1449 (89.7)
4th			33 (2.0)
5th			4 (0.2)
6th			28 (1.7)
7th			49 (3.0)
8th			28 (1.7)
CGPA	2.88	0.82	
Below 2.5			76 (4.7)
2.5 to 3			434 (26.9)
3 to 3.5			719 (44.5)
3.5 to 4			387 (23.9)
Discipline	4.23	2.97	
Electrical-engineering			230 (14.2)
Mechanical-engineering			248 (15.3)
Civil-engineering			126 (7.8)
Chemical-engineering			620 (38.4)
Computer-engineering			99 (6.1)
Industrial-engineering			55 (3.4)
Petroleum-engineering			60 (3.7)
Polymer-engineering			22 (1.4)
Mining-engineering			28 (1.7)
Metallurgical-engineering			36 (2.2)
Materials-engineering			4 (0.2)
Geological-engineering			18 (1.1)
Software-engineering			25 (1.5)
Architecture-engineering			42 (2.6)
Environmental-engineering			1 (0.1)
Telecommunication-engineering			2 (0.1)
Institute	2.50	2.53	
UET Lahore			1135 (70.2)
Punjab University Lahore			18 (1.1)
KFUET Rahimyar Khan			50 (3.1)
IUB Bahawalpur			25 (1.5)
BZU Multan			94 (5.8
UET Taxila			97 (6.0)
University of Okara			73 (4.5)
University of Gujrat			60 (3.7)
MNU Multan			64 (4.0)

Table IV

Mean, standard deviation, and t-test of male and female engineering student's motivation during online class (*N*=1616)

Variables	Males Engineering Students (n=1352)	Females Engineering Students (n=264)			95 % CI		Cohen's d
Variables	M (SD)	M(SD)	t (95)	P	LL	UL	
Intrinsic motivation to know	14.4(3.0)	14.4(3.1)	.006	.162	.995	.00117	0.02
Intrinsic motivation toward accomplishment	14.4(2.71)	14.6(2.6)	-1.098	.401	.272	-.19923	-3.43
Intrinsic motivation to experience stimulation	14.6(2.89)	14.8(2.8)	-.897	.776	.370	-.17420	-2.03
Extrinsic motivation identified	15.14(2.92)	15.2(3.0)	-.400	.367	.689	-.07925	1.32
Extrinsic motivation introjected	15.2(2.94)	15.3(3.0)	-.563	.721	.573	-.11209	-1.32
Extrinsic motivation external regulation	14.7(2.99)	14.8(3.0)	-.315	.691	.753	-.06356	-0.75
Motivation	12.2(3.32)	12.2(3.2)	-.277	.434	.782	-.06175	-0.84

Table V

Correlation of academic motivation during online classes and access to internet engineering students (*N*=1616)

Variables	1	2	3	4	5	6	7	8
1. Internet Access	1	.						
2. Intrinsic motivation to know	.048	1						
3. Intrinsic motivation toward accomplishment	.018	.726**	1					
4. Intrinsic motivation to Experience stimulation	.055*	.764**	.749**	1				
5. Extrinsic motivation identified	.066**	.742**	.711**	.753**	1			
6. Extrinsic motivation introjected	.056*	.637**	.684**	.641**	.682**	1		.
7. Extrinsic motivation external regulation	.053*	.607**	.594**	.588**	.729**	.690**	1	
8. Motivation	.004	-.025	.078**	.029	-.011	.124**	.119**	1

*Correlation is significant at 0.05.
**Correlation is significant at 0.01.

Discussion

The COVID-19 pandemic has significantly impacted the global education system due to the closure of schools, colleges, and institutions starting in March 2020 to stop the virus' spread. The transition from traditional to online classrooms has a significant impact on teachers' and students' one-on-one interactions, leading to an archetype change in the teaching and learning method. According to this context, it is essential to observe how learners perceive their online classrooms and their difficulties during the current COVID-19 outbreak (Khan, Kamal, Illiyan, & Asif, 2021). Another important aspect of being discussed here is the demographic profile of the students. Different demographic characteristics are crucial to consider while exploring motivation among students. For instance, a study highlighted that family is the third highest demographic characteristic for motivating students to study online (Cupitt & Golshan, 2015).

An extensive demographic profile of the students was made to analyze the demographic characteristics of the engineering students during online classes, which was divided into three main categories, personal, social, and educational. According to the results of personal and social characteristics, 83.7% of the sample were male students, only 16.3% were female students found in the field of engineering in Pakistan, and most of them were from the age group of 21 years (30.1%) to 22 years (27.8%). Most of the sample belongs to rural areas (59.7%), nuclear family systems (54.5%), unemployed (92.5%), and unmarried (98.3%) engineering students. The sample mentioned above mostly possesses 3 (23.5%) to 4 (25.3%), and most of them are 1st (27.4%) or 2nd (31.2%) born according to birth order.

The demographic profile of educational characteristics showed that 51.2% of the whole sample went to a private school and private college (67.3%) and 59.3% never went to any academy or coaching center. 88.8% of the whole sample opted for the field of engineering purely on their own choice; only 11.2% of the sample chose this field forcefully. The percentage of the day scholar (49.7%) and hostility (50.3%) students was almost the same. 70.2% of the sample was from UET Lahore, and mostly they were the students in 3rd semester (89.7%). The most studied engineering discipline is chemical engineering (38.4%) among 15 other disciplines. The CGPA of most students was 3 to 3.5 (44.5%), and they spent mostly 2 to 4 hours on the study (35.5%) per day.

The results showed that gender difference in motivation during online classes among engineering students was not significant for any of the seven sub-themes of the motivation level of the students. A similar study in the Pakistani context was conducted on the medical

students of the Poonch Medical College of Azad Kashmir, Pakistan (Javaeed et al., 2019). The same questionnaire (AMS) was used to assess the motivation level of the medical students with the demographic variable. The results of the study were not similar to the present study, there was a significant gender difference among the motivation level of the medical student, and female student's motivation level was higher than male students. An international study also concluded that students' socio-demographic standing, like age, gender, and level of education, have strong association with their educational performance (Rizvi et al., 2019).

But, in another demographic, access to the internet was significantly and positively correlated with four out of seven sub-themes of the motivation levels respectively, Intrinsic motivation (to experience stimulation) (r=.055*), Extrinsic motivation (identified) (.066**), Extrinsic motivation (introjected) (.056*) and Extrinsic motivation (external regulation) (.053*).

Conclusion

An extensive demographic profile of engineering students is made and analyzed through this study. It is concluded from the above-presented study that engineering students' level of academic motivation correlates with a most practical demographic variable: access to the internet. It is now evident that students' intrinsic and extrinsic motivation is significantly correlated with the access to internet. Hence, no significant gender difference is found among engineering students' motivation levels during online classes.

Limitations and Suggestions

Along with many strengths, this study has a few limitations. For example, due to the low availability of similar studies, the motivation level of engineering students could not be compared to other students in same fields. Another limitation could be that the data was collected through online resources, resulting in the ignorance of students who need help accessing the internet facilities. It is suggested that the data should be collected through both resources online & physical mode) to better understand the viewpoints of the students. The comparison of engineering students' academic motivation with other educational fields like social or medical sciences would be enlightening addition to the research in this field. This conceptualization can also be extended to qualitative method to explore potential threats to the motivation of students.

Implication and Future Directions

This study provides a great opportunity to understand the demographical viewpoint to understand the contributing factors in the success or failure of online education in Pakistan. Unlike any developed country, Pakistani students have faced most basic issues, most of which are related to lifestyle (demographical). This study will help the stakeholders like educationists as well as the students themselves to better understand the basic hurdles in academic motivation during an online class. Better policies can be made on providing online education to students in the future based on the findings of this study.

Acknowledgment

REFERENCES

Aboagye, E., Yawson, J. A., & Appiah, K. N. (2021). COVID-19 and e-learning: The challenges of students in tertiary institutions. *Social Education Research, 2*(1), 1-8. https://doi.org/10.37256/ser.212021422.

Adams, N., Little, T., D., & Ryan, R., M. (2017). Self-determination theory. *Development of Self-Determination Through the Life-Course, 55* (1), 47–54. https://doi.org/10.1093/oso/9780190638054.003.0019.

Avila, E., C., & Genio, A. (2020). Motivation and learning strategies of education students in online learning during pandemic. *Psychology and Education Journal, 57*(9), 1608-1614.

Caleon, I., Wui, M., Tan, J., Chiam, C., Soon, T., & King, R. (2015). Cross-cultural validation of the Academic Motivation Scale: A Singapore investigation. *Child Indicators Research, 8,* 925-942. https://doi.org/10.1007/s12187-014-9298-7.

Cupitt, C., & Golshan, N. (2015). Participation in higher education online: Demographics, motivators, and grit. Paper Presented at *STARS Conference*, Melbourne, Australia.

Deci, E. L., & Ryan, R. M. (1980). Self-determination theory: When mind mediates behavior. *The Journal of Mind and Behavior, 1*(1), 33-43. https://www.jstor.org/stable/43852807 .

Deci, E., L., & Ryan, R., M. (1985). Conceptualizations of intrinsic motivation and self-determination. *Intrinsic motivation and self-determination in human behavior*. Berlin, Germany: Springer.

Deci, E., L., & Ryan, R., M. (1991). *A motivational approach to self: integration in personality*.

Deci, E. L., & Ryan, R. M. (2000). The" what" and" why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry, 11*(4), 227-268. https://doi.org/10.1207/S15327965PLI1104_01.

Deci, E., L., Vallerand, R., J., Pelletier, L., G., & Ryan, R., M. (1991). Motivation and education: The self-determination perspective. *Educational Psychologist, 26*(3-4), 325-346. https://doi.org/10.1080/00461520.1991.9653137.

Fairchild, A., J., Horst, S., J., Finney, S., J., & Barron, K., E. (2005). Evaluating existing and new validity evidence for the academic motivation scale. *Contemporary Educational Psychology, 30*(3), 331-358. https://doi.org/10.1016/j.cedpsych.2004.11.001.

Fallah, R., H., M., & Syed, J. (2018). A critical review of Maslow's hierarchy of needs. *Employee Motivation in Saudi Arabia*,London, UK: Palgrave Macmillan .

Gabales, Y., Sabandal, M., Saluta, J., F., Bermudez, D., Gimeno, A., R., & Goles, N., A. (2022). Mathematics performance, e-learning experiences, and demographics among the university students via distance education: A correlational study. *Journal of Positive School Psychology, 6*(4), 7936-7948.

Harlow, S. (2022). Assessing demographics and needs of online students before and during the COVID-19 pandemic: Lessons from academic libraries. *Journal of Library & Information Services in Distance Learning, 16*(1), 1-18. https://doi.org/10.1080/1533290X.2022.2056279.

Hartnett, M. (2016). Motivation in online education. Singapore: Springer.

Hwang, G., J., Wang, S., Y., & Lai, C., L. (2021). Effects of a social regulation-based online learning framework on students' learning achievements and behaviors in mathematics. *Computers & Education, 160*, 1-9. https://doi.org/10.1016/j.compedu.2020.104031.

Java, A., Asghar, A., Allaway, Z., Haider, Q., Mustafa, K., J., & Ghauri, S., K. (2019). Assessment of academic motivation level of undergraduate medical students of Azad Kashmir, Pakistan. *Cureus, 11*(3), 1-8. https://doi.org/10.7759/cureus.4296 .

Khan, M., A., Kamal, T., Illiyan, A., & Asif, M. (2021). School students' perception and challenges towards online classes during COVID-19 pandemic in India: An econometric analysis. *Sustainability, 13*(9), 1-15. https://doi.org/10.3390/su13094786.

Mada, R., D., & Anharudin, A. (2019). How online learning evaluation (Kahoot) affecting students' achievement and motivation (case study on it students). *International Journal for Educational and Vocational Studies, 1*(5), 422-427. https://doi.org/10.29103/ijevs.v1i5.1494.

Putra, R. W. P. (2021). Improving the students' motivation in learning English through google meet during the online learning. *English Learning Innovation, 2*(1), 35-42. https://doi.org/10.22219/englie.v2i1.14605.

Rafiq, F., Hussain, S., & Abbas, Q. (2020). Analyzing students' attitude towards e-learning: A case study in higher education in Pakistan. *Pakistan Social Sciences Review, 4*(1), 367-380. https://doi.org/10.35484/pssr.2020(4-i)29.

Rafique, G. M., Mahmood, K., Warraich, N. F., & Rehman, S. U. (2021). Readiness for online learning during COVID-19 pandemic: A survey of Pakistani LIS students. *The Journal of Academic Librarianship, 47*(3), 1-10. https://doi.org/10.1016/j.acalib.2021.102346.

Rizvi, S., Rienties, B., & Khoja, S., A. (2019). The role of demographics in online learning; A decision tree based approach. *Computers & Education, 137*, 32-47. https://doi.org/10.1016/j.compedu.2019.04.001.

Rosman, M., R., M., Rosli, N., N., I., N., Shukry, A., I., M., Razlan, N., M., & Alimin, N., A., (2022). Entangling the interrelationship between demographics profiles, referencing competencies and individual performance in the digital environments. *International Journal of Emerging Technologies in Learning (Online), 17*(9), 1-12. https://doi.org/10.3991/ijet.v17i09.29457.

Ryan, R., M., & Deci, E., L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*(1), 68.

Saeed, S., & Zyngier, D. (2012). How motivation influences student engagement: A qualitative case study. *Journal of Education and Learning, 1*(2), 252-267. https://doi.org/10.5539/jel.v1n2p252.

Shih, H.,F., Chen, S.,H., E., Chen, S., C., & Wey, S., C. (2013). The relationship among tertiary level EFL students' personality, online learning motivation and online learning satisfaction. *Procedia-Social and Behavioral Sciences, 103*, 1152-1160. https://doi.org/10.1016/j.sbspro.2013.10.442.

Vallerand, R., J, Blais, M., R., Brière, N., M., & Pelletier, L., G. (1989). Construction et validation de l'échelle de motivation en éducation (EME). *Canadian Journal of Behavioural Science/Revue Canadienne Des Sciences Du Comportement, 21*(3), 323-349. https://doi.org/10.2307/j.ctv18ph1th.18.

Vallerand, R., J., Pelletier, L., G., Blais, M., R., Briere, N., M., Senecal, C., & Vallieres, E., F. (1992). The academic motivation scale: A measure of intrinsic, extrinsic, and motivation in education. *Educational and Psychological Measurement, 52*(4), 1003-1017. https://doi.org/10.1177/0013164492052004025.