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Message from the Editor-in-Chief

Hello from TOJDEL

The Online Journal of New Horizon in Education (TOJNED) welcomes you. TOJNED also thanks all researchers, practitioners, administrators, educators, teachers, parents, and students from all around the world for visiting the issues of TOJNED. TOJNED has successfully diffused innovation on new development in education science around the world.

TOJNED is a quarterly journal (January, April, July and October). This online periodical is devoted to the issues and applications of education. Reviewed by leaders in the field, this publication is designed to provide a multi-disciplinary forum to present and discuss all aspects of education.

TOJNED provides new development in education forum and focal points for readers to share and exchange their experiences and knowledge with each other to create better research experiences on education. The main purpose of this sharing and exchange should result in the growth of ideas and practical solutions that can contribute toward the improvement of education.

TOJNED records its appreciation of the voluntary work by the following persons, who have acted as reviewers for one or more submissions. The reviewers of this issue are drawn quite widely from the education field. Reviewers' interests and experiences match with the reviewed articles.

I am always honored to be the editor-in-chief of TOJNED. Many people gave their valuable contributions to this issue. I would like to thank the editorial board of this issue.

TOJNED invites article contributions. Submitted articles should be about all aspects of education science. The articles should also discuss the perspectives of students, teachers, school administrators and communities. The articles should be original, unpublished, and not in consideration for publication elsewhere at the time of submission to TOJNED.

For any suggestions and comments on the international online journal TOJNED, please do not hesitate to contact us.

July 01, 2023

Editor,
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AN INVESTIGATION OF CORONA VIRUS PANDEMIC ON THE ONLINE EDUCATION: A STRUCTURAL MODELLING APPROACH

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ABSTRACT
This study aimed to find out the effect of Corona Virus Environment (CVE) with the Online Education-Study from Home (OESFH) and to know the mediating impact of Corona Virus Awareness (CVA) between Corona virus Environment and Online Education-Study from Home. The first hypothesis has been formulated as there is no significant effect of Corona Virus Environment on the Online Education-Study from Home whereas the second hypothesis formulated as Corona Virus Awareness does not significantly mediate the relationship between Corona Virus Environment and the Online Education-Study from Home. The mediating analysis has been done for the testing of hypotheses. The findings of this study conclude that there is an effect of Corona Virus Environment on the Online Education and Corona Virus Awareness significantly mediates the relationship between the Corona Virus Environment and the Online Education-Study from Home.
Keywords: Corona Virus Awareness (CVA); Corona Virus Environment (CVE); Online Education-Study from Home (OESFH)

1. Introduction

The full form of COVID-19 was explained as CO stands for Corona, VI stands for Virus and 19 stands for year 2019. WHO issued the various helpful guidelines to remove this Corona virus pandemic as early as possible. World Health Organization warned that more critical and adverse time is about to come. **(World Health Organization, 2020)** The avian infectious bronchitis virus, the first known Corona virus, was identified in 1937 and was responsible for catastrophic infections in chickens. Corona virus is a tragedy that is worse than a world war in every facet of life, regardless of who is affected. This Corona virus infection is a frightening warning of human mortality. Some sources indicated that the Corona virus was developed at the Wuhan Institute of Virology in China, while others claim that it was spread by bats, who can live with more than sixty different types of viruses, including the Corona virus. Bacteria and viruses, which cause numerous diseases in the human body, are two highly important components in the medical sector. The bacteria is a living system, whereas the virus is either non-living or somewhere in between. Zika virus, a flavivirus, was first identified in the America in March 2015, in Bahia, in the Northeast region of Brazil. Zika virus was first identified in the America in March 2015, in Bahia, in the Northeast region of Brazil. Brazil reported an association between Zika virus infection and Guillian-Barré syndrome in July 2015. Transmission of Zika virus from mother to fetus and sexual transmission have both been reported. **(Carvalho et al., 2017).** The emergence of Omicron, the fifth and latest variant of concern (VOC) of SARS CoV2, changed almost everything for India. The COVID-19 vaccination was getting accelerated and there was a glimmer of hope that by early 2022, life would return to normal. Nearly all states of India are showing an upward trend with a rise in test positivity rate (TPR). The active COVID-19 cases have reached a seven-month high, in spite of change in the case definition. India now is in the middle of the third wave of the COVID-19 wave and on 19 January 2022, India reported around 317,000 new cases. The active COVID-19 cases have reached a seven-month high, in spite of change in the case definition, where a confirmed COVID-19 case is taken off the list of the active cases after seven days, against the earlier approach of being considered an active case for 14 days. Regardless whether a country is emerging or developed, the Corona virus is spreading. One of the recommended strategies to protect oneself from the Corona virus is to welcome oneself in the Indian style of '**Namaste = Greeting Posture by folded hands**.' Online education and online job industries are booming in this suffocating climate. Studying and working from home are two unique notions aimed at addressing the current scenario. The majority of people are considering studying or working from home. The researcher has proposed three constructs in this study: Corona Virus Environment, Corona Virus

Awareness, and Online Education-Study at Home. Corona virus Awareness displays accurate and relevant information about the virus and online education-study from home, whereas Corona Virus Environment influenced all part of life. The education sector must act quickly to develop online education patterns in the wake of the Corona pandemic.

2. Literature review

To investigate the Corona Virus Environment on the online education, various offline and online platforms were used. Previous researches have been studied on the aforesaid topic. This information helped in the exploratory research. In the exploratory research, the null and alternative hypotheses have been formulated to get the desired objectives of this research. The previous researches have been underlined as follows: In the current situation of Corona virus Environment, the school administration implementing the government guidelines and maintaining the social distancing in all their academic and administrative activities**(Uscher-Pines et al., 2018).** Twenty-eight bioactive imidazole compounds with the pharmaceutical application were docked against the Corona virus. Every country is trying to get the vaccine as early as possible to give a healthy life to every individual**(Abdallah, 2019).** The government invested a huge amount of money to overcome the adverse effect of the virus pandemic. The government used the technology to track the actual effect of virus pandemic and then designed various systems to complete the eradication of the disease**(Serpa, n.d.).** The effect of Corona virus in Nepal was very deadly because the total economy is based on imports and other countries. The education and every aspect of life in Nepal faced an adverse effect. The developed countries as well as the Indian economy helped the Nepalese economy in this critical condition**(Koirala & Acharya, 2020)**. Research revealed that the general population is experiencing a relatively intensive psychological impact manifested as a sense of depression, anxiety, dread, and varieties of somatization symptoms. This pandemic affects the life of every human being. This Corona virus created fear in the personal and professional lives of every individual. The symptoms of cough and cold have also been treated as Corona virus**(Liu et al., 2020).** The actual condition of China's economy was in huge profit. Corona virus is used to boost the Chinese economy. The whole world was facing the problem of business as well as their life, but the Chinese government solved this problem very effectively. Though the birth of Corona virus was China, it was trying to pretend that its economy wasn't in danger**(Bouey, 2020).** The Corona virus affected the business world as well as academic environment in the entire globe. This virus has given the opportunity to every-one, how to work and how to study in this critical situation of Corona pandemic. The whole world is learning new system, new platform to work and study without any interruption. The work from home and study from home concept helped in this time to solve this Corona pandemic**(OECD, 2020)**. The whole world is moving in the direction of online mode. Online education and online work are the need of the hour. The teaching and work were a challenge in this Corona virus environment. An online platform like Zoom, Google meet the technological system helped in handling the adverse situation of the Corona virus**("Moving online now: How to keep teaching during corona virus," 2020).** The Chinese government implemented various laws and strict rules for the complete removal of this Corona virus from the country. China is a country where the whole economy is based on the manufacturing sector. The Chinese government earned huge amount of profit by exporting medical surgical items to the whole world. Every country was in fear, hence imported various medical and surgical items from China. This scarcity of medical products converted in the huge profit for the China**(Hua & Shaw, 2020)**. The education world, teachers, school administration, school staff have faced this Corona pandemic. Many teachers, leaders, and learners are experiencing an unprecedented situation in their schools. There is an urgent need for an online schooling system to solve this problem. The children, students, teachers were adopting the new way of teaching and learning. The schools were closed but not the teaching and education in this Corona virus pandemic**(The International Baccalaureate Organization, 2020).** It was predicted that this virus will be removed in the coming future, but every aspects of life was facing question mark whether it is business or education. The whole world is searching the solution with the resources available in the country. The developing countries were facing more in comparison to the developing economy**(Jia, Li, Jiang, Guo, & Zhao, 2020).** The future economy will be faced on the online mode. The internet and internet speed will play a vital role to boost the economy. The informed and educated people will handle this Corona virus situation very efficiently. Education and financial sector needs the use of new learning methodology**(Anand et al., 2020).** Online methods of teaching support and facilitate learning–teaching activities, but there is a dire need to weigh the pros and cons of technology and harness its potentials. Disasters and pandemic such as Covid-19 can create a lot of chaos and tensions. There is an important need to study the technology deeply and with due diligence**(Dhawan, 2020).** The study establishes that the Coronavirus pandemic has adverse effects on education. COVID-19 has major effects on school characteristics, including research, academic programmes, professional development and jobs in the academic sector. The study emphasizes the need for adoption of technology as a way to curb the effects of future pandemics in education(**Onyema et al., 2020**). India has already planned to teach the numbers of students at home owing to its very vast 4G network. In India, almost everywhere 4G connectivity is available at a very low cost. Online teaching offers flexibility in teaching and learning and it also offers more tools and techniques for making the class motivating**(Protiva Kundu, 2020).**

Social isolation and the new circumstances created against the spread of COVID-19, including changes in education, have caused a number of concerns for children, parents, and teachers in Kosovo. The International Federation of Red Cross and Red Crescent Societies is concerned about the impact of COVID-19 on children, parents, and teachers in Kosovo**(Duraku & Hoxha, 2020)**. A pandemic lockdown affected the academic performance of most participants with varying degrees. The main challenge online education faces in veterinary medical science is how to give practical lessons. Online education can be improved by making it more interactive, showing medical procedures in real situations and providing 3D virtual tools to mimic the real situation**(Mahdy, 2020).** Online education has been on the fringe for a long time in India. The COVID- 19 pandemic made it the mainstream. We conducted a survey to know the opinion of undergraduate students in a university in India on different aspects of online education during the COVID-19 pandemic**(Arora, 2020).** E-learning is a valuable method of teaching medical students. It is effective in increasing knowledge and is highly accepted. But it is important not to focus only on increasing knowledge, but also on clinical and social skills. E-learning should not only be based on the delivery of content, but students should be able to work with the materials and receive feedback**(Agarwal & Kaushik, 2020).** India's higher education system is the world's third largest in terms of students next to China and the United States. The COVID-19 pandemic has severely affected the economic and educational health of India. Online teaching poses technical difficulties that affects the efficacy of Teaching-Learning Process. Survey indicated that the online sessions of problematic subjects are difficult, but theoretical subjects are easy to understand. India's Higher Education sector has witnessed a tremendous increase in the number of Universities/University level Institutions & Colleges since independence**(Lakshman Naik et al., 2021).** For the educational environment it is extremely important to take measures aimed at protecting young students. This includes providing students with equal and non-discriminatory education opportunities, equal training for all students and protection of students with various vulnerabilities. A priority of the reorganization of the education system is to identify responses to current emerging requirements**(Butnaru et al., 2021).** The COVID-19 epidemic affected the academic performance of different grades in various participants. Online learning helps students to continue with the opportunity for self-study. However, the crucial challenge of secondary school facing online education in Bangladesh's rural area is how to give practical lessons. Improvements can be made by making online learning more accessible **(Ahmed Masud & Nesa Suborna, 2021).** Due to the pandemic situation globally, all the colleges and universities were shifted to online mode by their respective governments. No one has the information that how long this pandemic will remain, and hence the teaching method was shifted to an online mode. Even though some of the educators were not tech-savvy, they updated themselves to battle the unexpected circumstance **(Gopal et al., 2021).** To slow the spread of COVID-19, one of the major steps is staying at home. These days technology is more useful in our daily life. This study proved that mostly Central Universities are providing online classes during the lockdown period. Apps like Zoom, WebEx, Google Meet have been helping the students to learn at home in this pandemic period. Online learning provides an opportunity to enhance skills and importance in self-development **(Aslam et al., 2021).** The COVID-19 study could provide a meaningful reference for online teachers and instructors to improve the effectiveness of online instruction. This study revealed the effect of educational levels, gender, and personality traits on online learning outcomes **(Yu, 2021).** The online learning was found to be advantageous as it provided flexibility and convenience for the learners. Most students also reported that online classes could be more challenging than traditional classroom because of the technological constraints, delayed feedback and inability of the instructor to handle the Information and Communication Technologies **(Muthuprasad et al., 2021).**

3. Research Gap

The rationale of the study was to know the mediation role of Corona Virus Awareness in the relationship between Corona Virus Environment with the Online Education-Study from Home. The mediation analysis was previously used in the analysis of the financial study and consumer behavior but for education, it has been used in this research paper. The previous authors have not studied the mediation role of Corona Virus Awareness concerning Corona Virus Environment with the Online Education-Study from Home; therefore, this research gap has been identified and taken up for the study.

4. Objectives

The specific objectives of this research are as follows:

- To study the effect of Corona Virus Environment on the Online Education-Study from Home.
- To study the intervening role of Corona Virus Awareness in the relationship between Corona Virus Environment with the Online Education-Study from Home.

5. Hypotheses

Based on the objectives, the following null hypotheses have been formulated. The first hypothesis is a direct path relationship whereas the second hypothesis is a mediating hypothesis.

$H0_1$: There is no significant effect of Corona Virus Environment on the Online Education-Study from Home.
$MedH0_2$: Corona Virus Awareness does not significantly mediate the relationship between Corona Virus Environment and the Online Education-Study from Home.

6. Material and Methods

The pilot study has been conducted with a sample of 43 respondents which is 10% of the total sample size (430) under this research. Primary data have been collected from a group of 430 respondents using the web-based structured questionnaire. The snowball sampling technique was used for the identification and collection of the respondent's opinions. Primary data was collected using Google Forms. The structured questionnaire was designed on the online Google platform for a fast and easy collection of responses. The primary data were collected from December 2020 to February 2021. This research was conducted in Uttar Pradesh, Delhi and NCR, India. Most of the respondents were between 21 to 30 years of age and graduates. 67.44 % of respondents were male whereas 30.23% female. The nominal scale has been used for demographics variables whereas the Likert 5-point scale has been used for three constructs as Corona virus Environment, Corona virus Awareness, and Online Education-Study from Home. The scale of 1 strongly disagrees whereas 5 is considered as strongly agree. The statistical techniques used were a reliability test and factor analysis (Principal Component Analysis). The Cronbach's Alpha, Corrected Item Total Correlation (CITC), Kaiser-Meyer-Olkin (KMO) Test, and Factor Analysis have been used for the finalization of the questionnaire. The convergent validity through Average Variance Extracted (AVE)was established on each construct. The Average Variance Extracted (AVE) is a measure of the amount of variance captured by a construct from each scale. The AVE has a recommended value of 0.50 or higher to provide evidence for convergent validity. Lastly, the discriminant validity was also established as AVE values came out to be greater than Squared Multiple Correlation (SMC) values. For the confirmatory factor analysis, a measurement model has been used. Structural Equation Modeling (SEM) has been used for the final analysis and interpretation of the formulated hypothesis. (Verma et al., 2020) The SEM model is a combination of factor analysis and regression analysis. This SEM technique is very useful in the direct path analysis, mediating analysis, and moderator (group) analysis. In this research, only direct path analysis and mediating analysis have been used. The basic results have been designed using SPSS 23.0 version whereas complex analysis has been done through the AMOS 23.0 version.

7. Measurement of variables

7.1 Exploratory Factor Analysis (EFA)

Since Cronbach's Alpha is 0.950 for the Corona virus Environment, 0.858 for Corona virus Awareness, and 0.941 for the Online Education-Study from the Home construct, hence all the constructs have passed the limit of 0.70. The min 0.60 KMO value is preferable for better results. The higher the value of KMO, the better it is. The KMO value of 0.848 is very good. As the KMO value is 0.894 for the Corona virus Environment construct, 0.750 for the Corona virus Awareness construct, and 0.846 for the Online Education-Study from the Home construct, hence the selected constructs have also passed the sampling adequacy test. KMO is a sample adequacy test. As the AVE is above 0.50, hence proved the evidence for convergent validity. Lastly, the discriminant validity was also established as AVE values came out to be greater than Squared Multiple Correlation (SMC) values. The composite reliability values (CR) are also above 0.70. Based on the above results, seven items have been finalized for the Corona virus Environment construct(such as CVE5.6 Self-awareness and discipline, CVE5.7 Realization of social responsibility, CVE 5.8 Development of habit of living with limited resources, CVE5.9 Rise in habit of making savings, CVE5.10 Realisation of feeling not to waste the resources, CVE5.11 Rise in hygiene, and CVE5.12 Work from home, six items have been finalized for the Corona Virus Awareness construct (such as CVA3.1 I know the seriousness of Corona virus, CVA3.2 Warm weather stops the outbreak Corona virus, CVA3.3 Corona virus transmits person to person, CVA3.4 Origin of Corona virus is in Wuhan, China, CVA3.5 Corona is more dangerous than world war, CVA3.6. There are four stages in Corona virus infection, and five items have been finalized for the Online Education- Study from Home construct (such as OESFH4.1; Online line education is the best way to study in Corona environment, OESFH4.2; Online education are more preferable in corona environment, OESFH4.3; Online education helps to teach students globally, OESFH4.4; Online line education is cost effective, OESFH4.5; Online education provides flexibility in learning). All the seven items explained 77.068% of the variance for Corona virus Environment construct, All the six items explained 59.937% of the variance for Corona virus Awareness construct, and five items explained 81.355% of the variance for the Online Education-Study from the Home construct, therefore all the selected construct (latent variable) and their items (observed variable) are reliable and can be used in the SEM model. (See Table 1)

Table 1: Reliability, Validity, and Exploratory Factor Analysis (EFA) (Principal Component Analysis)

Construct	**Cronbach's Alpha**	**Kaiser-Meyer-Olkin (KMO) Test**	**% of Variance**	**Average Variance Extracted (AVE)**	**Composite Reliability (CR)**	**Number of Items**
(CVE	.950	.894	77.068	0.770	0.959	7
CVA	.858	.750	59.937	0.599	0.896	6
OESFH	.941	.846	81.355	0.813	0.956	5

Source: SPSS 23.0 output

Note: Corona Virus Environment (CVE), Corona Virus Awareness (CVA), and Online Education: Study from Home (OESFH

7.2 Validation and development of model: Confirmatory Factor Analysis (CFA)

The minimum CMIN/DF was achieved for each construct under the measurement and the structural model.

7.2.1 CFA - Corona Virus Environment

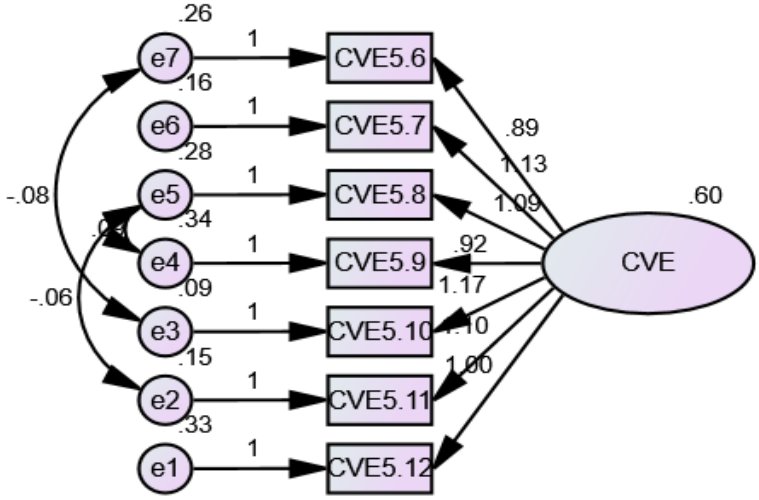

Figure 1: CFA - Corona Virus Environment

The figure depicts that the Corona Virus Environment having seven items represented by the rectangular shape also known as observed variables and the latent variable. Corona virus Environment is represented by oval shape. The model fit indices show that the CFA model is a good fit model.

CMIN		DF	P		CMIN/DF
76.965		11	.000		6.997
GFI	AGFI	TLI	CFI	NFI	RMSEA
.957	.890	.958	.978	.975	.118

Source: AMOS 23.0 output

7.2.2 CFA - Corona Virus Awareness
Source: AMOS 23.0 output

7.2.3 CFA - Online Education-Study from Home

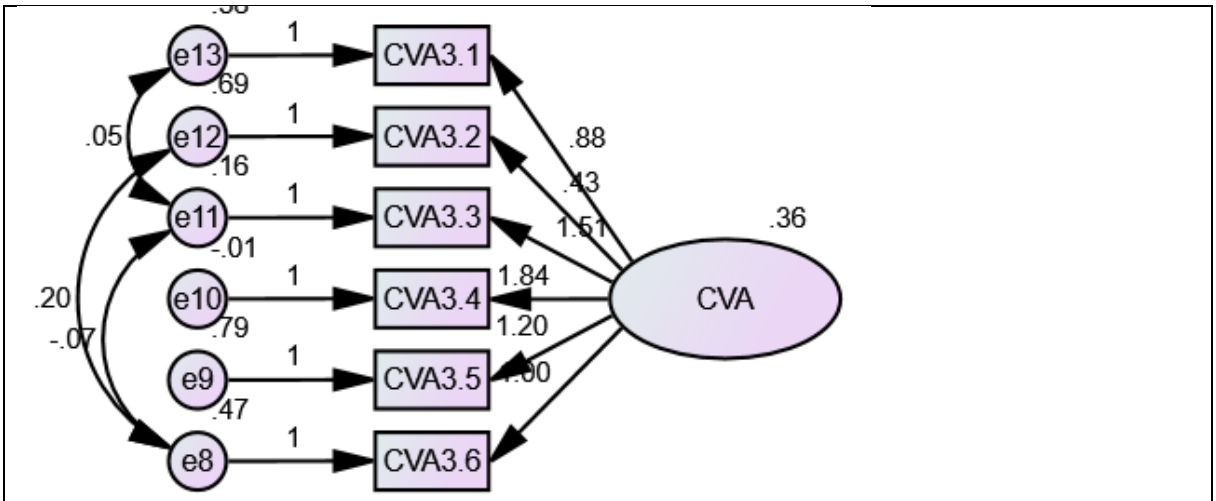

Figure 2: CFA for Corona Virus Awareness
The model fit indices show that the CFA model is a good fit model.

CMIN		DF	P		CMIN/DF
30.611		6	.000		5.102
GFI	AGFI	TLI	CFI	NFI	RMSEA
.977	.921	.964	.986	.982	.098

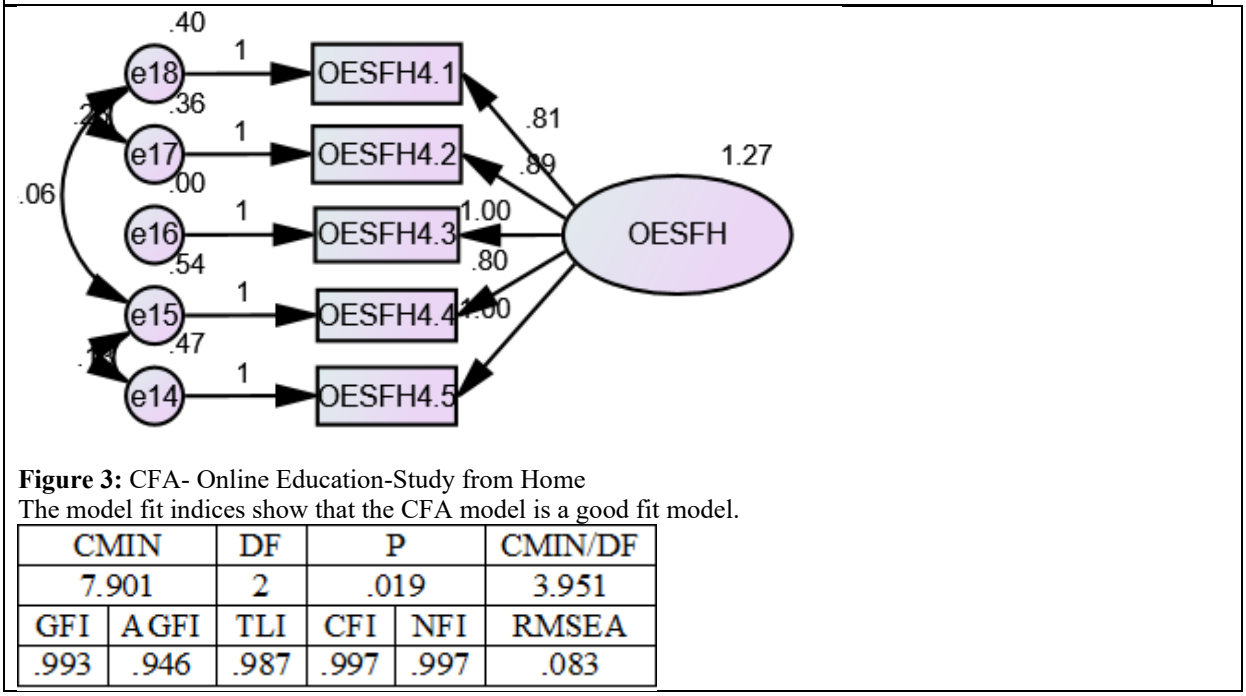

Figure 3: CFA- Online Education-Study from Home
The model fit indices show that the CFA model is a good fit model.

CMIN		DF	P		CMIN/DF
7.901		2	.019		3.951
GFI	AGFI	TLI	CFI	NFI	RMSEA
.993	.946	.987	.997	.997	.083

Source: AMOS 23.0 output

8. Findings

8.1 Correlation Matrix

The correlation matrix explains the correlation between the construct. The results of the correlation matrix as correlation coefficient and p values define that whether the correlation is significant or not.

Table 2: Correlation Matrix

			Estimate	p-value
CVE	<-->	CVA	.644	0.000
CVA	<-->	OESFH	.720	0.000
CVE	<-->	OESFH	.495	0.000

Source: AMOS 23.0 output

8.2 Measurement Model

The measurement model helps in the study of covariance and correlation amongst the various construct. The measurement model shows the results of correlation coefficient and standardized regression estimates of every item associated with each construct. In the given measurement model, three constructs were uses as Corona Virus Environment, Corona Virus Awareness, and Online Education Study from Home. The Corona Virus Environment construct having seven items, The Corona Virus Awareness construct having six items, and Online Education Study from Home construct having five items. The correlation matrix and standardized regression weights results validate the measurement model for the next level of analysis known as structural equation modeling.

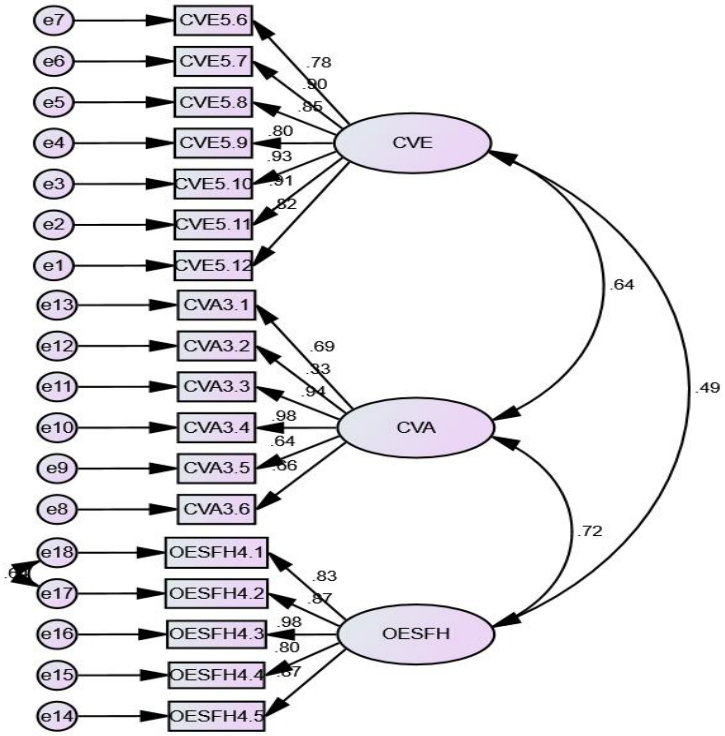

Figure 4: Measurement Model
Source: AMOS 23.0 output

The figure depicts that the measurement model having three constructs named Corona Virus Environment, Corona Virus Awareness, and Online Education-Study from Home. The Corona Virus Environment having seven items, Corona Virus Awareness having six items, and the Online Education-Study from Home having five items. The eighteen-error variables **(e1 to e18)** were used in this measurement model. The error variables are unexplained portions associated with those particular items. To get the better model fit indices, the error variables e17-e18 were correlated.

According to the correlation matrix Table 2 and measurement model Figure 4, it is clear that correlation among three constructs as Corona Virus Environment, Corona Virus Awareness, and Online Education Study from Home. The correlation coefficient is 0.644 which is more than moderate, between Corona Virus Awareness and the Online Education-Study from Home, the correlation coefficient is 0.720 which is high, and between Corona Virus Environment and the Online Education-Study from Home, the correlation coefficient is 0.495 which is moderate.

Table 3: Standardized Estimate

			Estimate

			Estimate
CVE5.12	<---	CVE	.816
CVE5.11	<---	CVE	.908
CVE5.10	<---	CVE	.933
CVE5.9	<---	CVE	.800
CVE5.8	<---	CVE	.849
CVE5.7	<---	CVE	.902
CVE5.6	<---	CVE	.777
CVA3.6	<---	CVA	.657
CVA3.5	<---	CVA	.639
CVA3.4	<---	CVA	.980
CVA3.3	<---	CVA	.937
CVA3.2	<---	CVA	.335
CVA3.1	<---	CVA	.688
OESFH4.5	<---	OESFH	.871
OESFH4.4	<---	OESFH	.795
OESFH4.3	<---	OESFH	.983
OESFH4.2	<---	OESFH	.867
OESFH4.1	<---	OESFH	.826

Source: AMOS 23.0 output

Table 3, shows seven items of Corona Virus Environment, six items of Corona Virus Awareness, and five items of the Online Education- Study from Home construct. All estimates are above the acceptable limit of 0.300.

8.3 Direct and Mediating Analysis

MedH0$_2$: Corona Virus Awareness does not significantly mediate the relationship between Corona Virus Environment and the Online Education-Study from Home

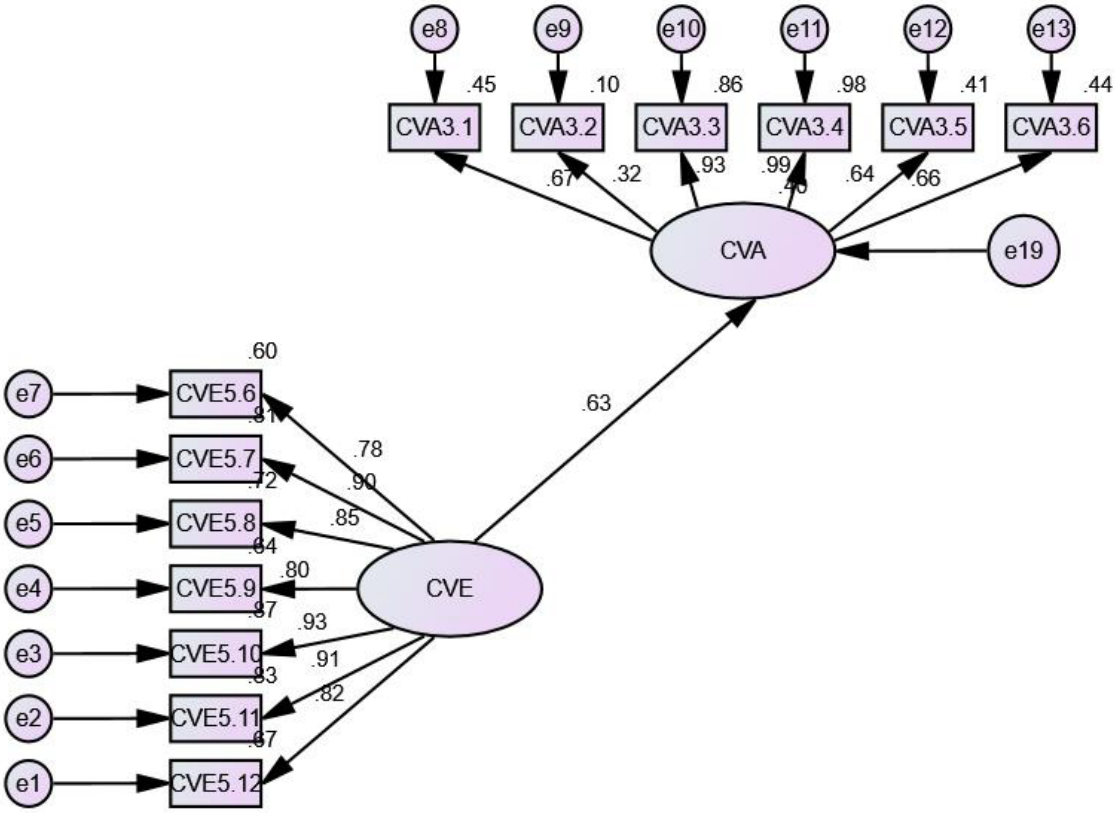

Figure 5: Effect of CVE on CVA
Source: AMOS 23.0 output
The figure depicts the effect of the Corona Virus Environment on Corona Virus Awareness.

Table 4: Path Estimate: Effect of CVE on CVA

Path	**Estimate**	**Standard Error**	**Critical Ratio**	**p-value**
CVE>CVA	0.634	0.039	11.304	0.000

Source: AMOS 23.0 output

According to the Table 4, it is clear that the sig value (p value=0.000) is less than 0.05, hence there is an effect of Corona Virus Environment on Corona Virus Awareness. The standardized regression weight is 0.634; hence, if there is one standard deviation increase in the Corona Virus Environment then there is a 0.634 standard deviation increase in Corona Virus Awareness. Since the standard error (S.E.) is low (0.039), hence the sample size is sufficiently large, and it truly belongs to the selected population. Since the critical ratio (C.R.=11.304) is > 1.96 for a regression weight of 0.634, hence the path between corona Virus environment and corona Virus awareness is significant at the 5% significance level. [Z Score 1.645, 1.96, 2.76 represents 90%, 95%, 99% confidence Interval respectively].

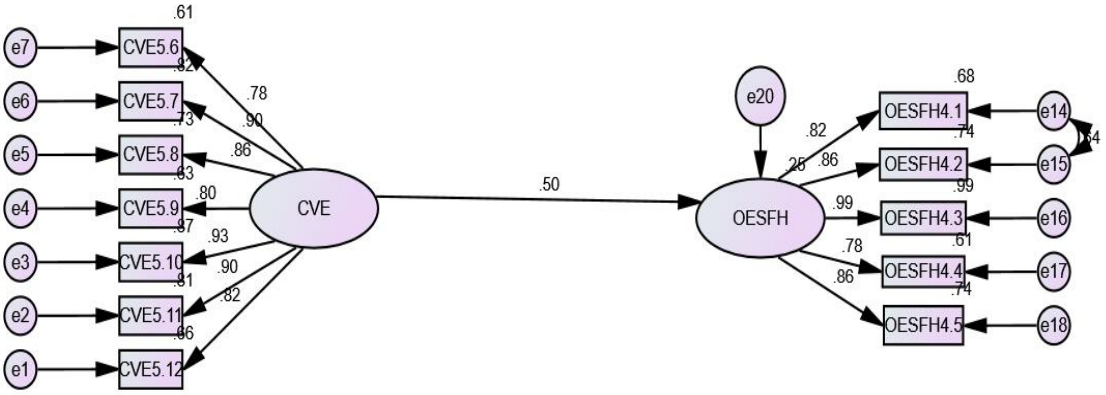

Figure 6: Effect of CVE on OESFH
Source: AMOS 23.0 output
The figure depicts the effect of the Corona Virus Environment on the Online Education-Study from Home.

Table 5: Path Estimate: : Effect of CVE on OESFH

Path	Estimate	Standard Error	Critical Ratio	p-value	Results
CVE>OESFH	0.500	0.058	10.090	0.000	Significant

Source: AMOS 23.0 output

From Table 5, it is clear that the sig value (p value=0.000) is less than 0.05, hence it is safe to reject null hypothesis $H0_1$, therefore it can be concluded that there is a significant effect of Corona Virus Environment on the Online Education-Study from Home. The standardized regression weight is 0.500; hence, if there is one standard deviation increase in the Corona Virus Environment then there is a 0.634 standard deviation increase in the Online Education-Study from Home. As the standard error (S.E.) is low (0.058), hence the sample size is sufficiently large, and it truly belongs to the selected population. Since the critical ratio (C.R.=10.090) is > 1.96 for a regression weight of 0.500, hence the path between Corona Virus Environment and the Online Education-Study from Home is significant at 5% significance level.

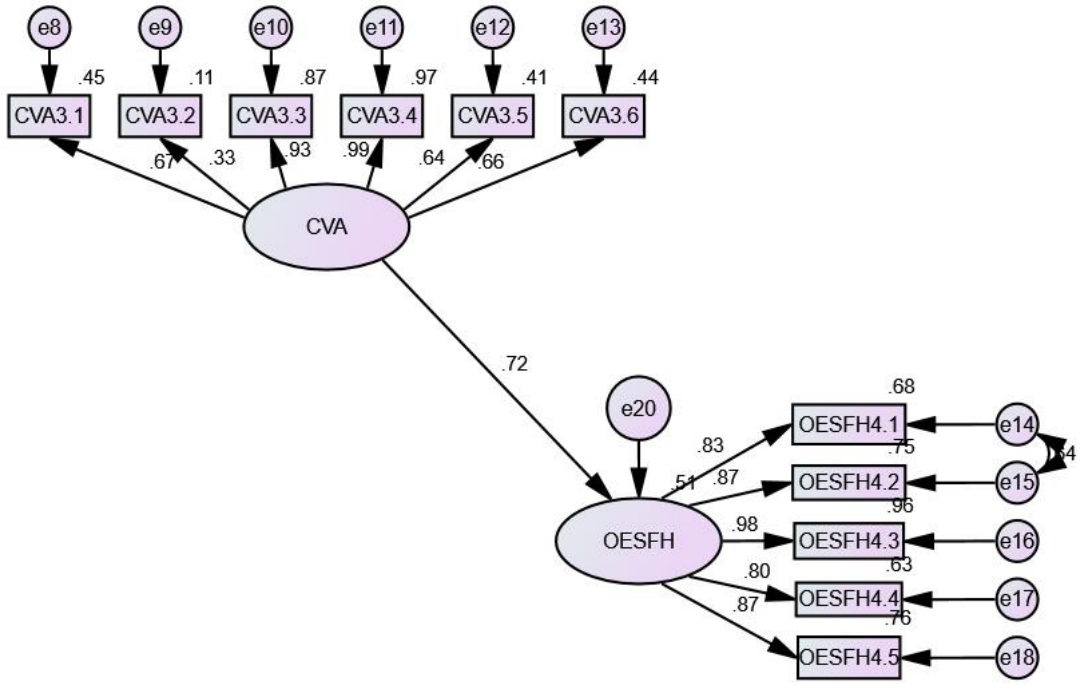

Figure 7: Effect of CVA on OESFH
Source: AMOS 23.0 output

The figure depicts the effect of Corona Virus Awareness on the Online Education-Study from Home.

Table 6: Path Estimate

Path	Estimate	Standard Error	Critical Ratio	p-value	Results
CVA>OESFH	0.715	0.096	12.526	0.000	Significant

Source: AMOS 23.0 output

From Table 6, it is clear that the sig value (p value=0.000) is less than 0.05, hence there is an effect of Corona Virus Awareness on the Online Education-Study from Home. The standardized regression weight is 0.715; hence, if there is one standard deviation increase in Corona Virus Awareness then there is a 0.715 standard deviation increase in the Online Education-Study from Home. As the standard error (S.E.) is low (0.096), hence the sample size is sufficiently large, and it truly belongs to the selected population. As the critical ratio (C.R. =12.526) is > 1.96 for a regression weight of 0.715, hence the path between Corona Virus Awareness and the Online Education-Study from Home is significant at 5% significance level.

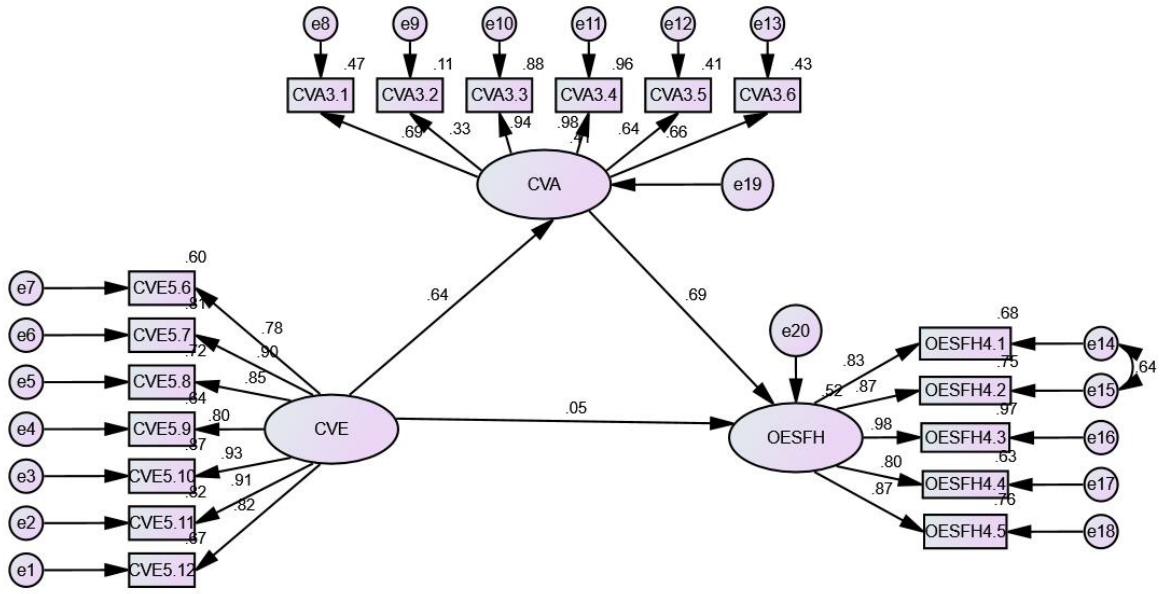

Figure 8: Mediating Analysis
Source: AMOS 23.0 output

The figure depicts the effect of the Corona Virus Environment on the Online Education-Study from Home with the mediation of Corona Virus Awareness.

Table 7: Path Estimate: Mediating Analysis

Path	Estimate	Standard Error	Critical Ratio	p-value	Results
CVE > CVA>OESFH	0.054	0.056	1.123	0.262	Insignificant

Source: AMOS 23.0 output

As p > 0.050 (p = 0.262), there exists full mediation by the mediating variable, hence it is safe to reject the null hypothesis $MedH0_2$. Therefore, Corona Virus Awareness significantly mediates the relationship between Corona Virus Environment and the Online Education-Study from Home, and standardized regression estimate values shrink from 0.475 to 0.054. Since the standard error (S.E.) is low (0.056), hence the sample size is sufficiently large, and it truly belongs to the selected population. Since the critical ratio (C.R. =1.123) is < 1.645 for a regression weight of 0.054, hence the path between Corona Virus Environment and the Online Education-Study from Home via Corona Virus Awareness is insignificant at the 10% significance level.

8.4 Total, Direct and Indirect Effect

In the total, direct and indirect effect analysis, there exist the full mediation by the introduction of Corona Virus Awareness in between Corona Virus Environment and the Online Education-Study from Home, therefore it can be concluded that the Corona Virus Awareness mediates between Corona Virus Environment and the Online Education-Study from Home. (See Table 8 to 14)

Table 8: Standardized Total Effects (Group number 1 - Default model)

	CVE	CVA	OESFH
CVA	.644	.000	.000
OESFH	**.495**	.685	.000

Source: AMOS 23.0 output

Table 9: Standardized Direct Effects (Group number 1 - Default model)

	CVE	CVA	OESFH
CVA	.644	.000	.000
OESFH	**.054**	.685	.000

Source: AMOS 23.0 output

Table 10: Standardized Indirect Effects (Group number 1 - Default model)

	CVE	CVA	OESFH
CVA	.000	.000	.000
OESFH	**.441**	.000	.000

Source: AMOS 23.0 output

Table 11: Standardized Total Effects - Two-Tailed Significance (BC) (Group number 1 - Default model)

	CVE	CVA	OESFH
CVA	.003	...	...
OESFH	**.002**	.007	...

Table 12: Standardized Direct Effects - Two-Tailed Significance (BC) (Group number 1 - Default model)

	CVE	CVA	OESFH
CVA	.003	...	...
OESFH	**.209**	.007	...

Source: AMOS 23.0 output

Table 13: Standardized Indirect Effects - Two-Tailed Significance (BC) (Group number 1 - Default model)

	CVE	CVA	OESFH
CVA	...	...	...
OESFH	**.002**	...	...

Source: AMOS 23.0 output

Table 14: Final Mediation Results

	Standardised Estimation	**P-Value**	**Results**	**Mediation Results On the introduction of CVA in between CVE and OESFH (Baron & Kenny's Method)**
Total Effect	0.495	0.002	Significant	Full Mediation
Direct Effect	0.054 reduced from 0.495 to 0.054)	0.209	Insignificant	
Indirect Effect	.0.441 (0.495-0.054)	0.002	Significant	

Source: AMOS 23.0 output

9. Conclusion

Based on the data analysis and findings, it can be concluded that the Corona Virus Environment, Corona Virus Awareness, and the Online Education-Study from Home have a close connection with each other. The Corona Virus Environment states that the lifestyle of the individuals in the environment of the corona pandemic, the Corona Virus Awareness states the correct and valuable information concerning to the Corona Virus and the Online Education-Study from Home is the virtual mode of traditional education system. There was a significant effect of Corona Virus Environment on the Online Education-Study from Home. Corona Virus Awareness significantly mediates the relationship between Corona Virus Environment and the Online Education-Study from Home. The standardized regression estimate shrink from 0.495 to 0.054 (p =0.209, insignificant), hence the Awareness about the Corona Virus is playing a major role in the relationship between the Corona Virus Environment and the Online Education-Study from Home. From the total, direct and indirect analysis, it is can

be concluded that there exists the full mediation of the introduction of Corona Virus Awareness in between Corona Virus Environment and the Online Education-Study from Home, therefore it can be finally concluded that the Online Education is growing in the Environment of Corona Virus where there is an awareness of the Corona Virus

10. Recommendations

The researcher suggested that the other constructs like symptoms of Corona Virus, the role of private medical professionals, the role of government professionals, protection, and control measures of corona Virus, online jobs work from home can also be considered in the next level of analysis. The research on the corona Virus is very limited, hence some more information is required for more accurate results in further research. The future researcher should collect more information on the linkage between the corona Virus and life-related variables.

11. Limitations

All three nominal variables age, gender, and educational qualifications were control variables and can be used in the next level of SEM analysis known as moderator analysis or group analysis. Is there any significant difference between males and females? Is there any significant difference among age groups? Is there any significant difference among educational qualifications in the context of the present study? This research was limited to only mediating analysis.

12. Scope for future study

Future researchers can use the moderator analysis or group analysis using AMOS SEM (Analysis of moment structure- structural equation modeling). The group can be gender, age, occupation, etc. Future researchers can check the significant difference between the groups concerning the effect of the corona Virus environment on the online education via the role of corona Virus awareness.

13. Social implications

The practical implication of this study will focus on the learning and adopting of a new pattern of Online Digital Education in the Corona Virus environment and awareness. The social implication of this study will help in creating awareness of the Corona Virus.

Ethics And Consent

As the study involved human respondents, therefore ethical consent was taken by stating the statement at the beginning of the questionnaire to each respondent, as “Any information filled in the questionnaire will not be used for any commercial purpose both during the research and after its publication”. All the respondents have given their consent for the study.

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Disclaimer

The findings in this study are those of the authors and do not necessarily represent the official position.

Authors’ Contributions

The author’s read and approved the final manuscript.

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ARTIFICIAL INTELLIGENCE AS PERCEIVED BY UNIVERSITY TEACHERS: AN ANALYSIS IN THE LIGHT OF DEMOGRAPHIC VARIABLES

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ABSTRACT
In the present study, we examined the perception of university teachers towards artificial intelligence in the light of demographic variables like gender, locality, age, teaching experience, and academic streams. We selected approximately 101 teachers from IFTM University, Moradabad as the sample for the study. We collected primary data on teachers' perceptions through online mode using *google forms*. The descriptive result revealed a mixed perception of university teachers about artificial intelligence. There was a significant effect of gender and age on the perception of teachers towards AI, which revealed that the perception of male teachers was higher towards artificial than females. Further, it revealed that the perception of teachers having above-average age was significantly higher than teachers having below-average age. Along with these, the results of the factorial analysis revealed a significant interaction effect of gender*teaching experience, locality*teaching experience, and gender*locality* teaching experience on the perception of artificial intelligence. The results of the study were discussed and implications were derived.
Keywords: Artificial Intelligence; University Teachers' Perception; Demographic Variables; Gender; Locality; Age; Academic Stream; Teaching Experience

Introduction

Artificial intelligence (AI) may be defined as the capacity of a computer or computer-controlled machine for operating high-level tasks. AI is endowed with the intellectual capacities to perform and generalize human activities. AI is embedded with symbolic and connectionist approaches, which are based on the 'top-down' approach and 'bottom up' approach respectively. In this context, the top-down approach mainly analyzes cognition and replicates intelligence in it in relation to the processing of symbols. On the other hand, the bottom-up approach generally creates a neural network in the brain in an artificial setting. It also helps in identifying letters of the alphabet. There are three goals of AI, i.e., strong AI, applied AI, and cognitive stimulation. The strong AI assists in building a machine that becomes able to start thinking, the applied AI assists to produce viable smart systems for diagnosis purposes, and cognitive simulation assists to test theories and models in relation to the working pattern of the human mind. AI is very much broad in its scope that encompasses a wide range of technological and mathematical components (Baker & Smith, 2019). In recent times, AI has influenced every aspect of human life in a positive manner (Adali, 2017). Most of the activities of human beings have been influenced by AI, as it is generally assumed that AI possesses human-specific abilities (Nabiyev, 2005). The application of AI is noticed in different fields related to 'Life Skills' and 'Science-Engineering-Technology-Society-Environment' (SETSE) dimensions in terms of curriculum (Keles & Aydin, 2021).

AI involves higher-order skills like inference, analysis, and decision making and performs tasks related to the human being (Duan et al., 2019; Topol, 2019). The use of AI can be noticed in every aspect of human life,

mostly in the medical field also it shows significant progress related to the identification of diseases and storing and processing of a large amount of medical data (Jantakun & Wannapiroon, 2017; Lathuiliere et al., 2019). According to Jantakoon & Jantakun, (2021), AI has been used in several fields for multiple purposes for providing intelligence services like recognising voice, taking appropriate decision, processing of language, programming in computers, translation, control system, etc. So far as education is concerned, AI has been found progressing significantly. In an educational setting, AI can be implemented in three broad ways i.e., "learner-oriented, instructor-oriented, and institutional system-oriented" (Baker & Smith, 2019). It can be considered a learning management system as it provides academic services like tracking students' academic progress, detecting plagiarism in academic contents, aiding in providing effective instructional strategies, analysing feedback, etc. It has a significant impact on students' learning in terms of recognizing gaps, getting personal support, freeing instruction from manual tasks (Bayne, 2015), developing effective learning practices, and improving technology-enhanced learning (Jantakoon et al., 2019; Jantakoon & Jantakun, 2021). However, the study also shows that people struggle and face difficulties related to the implementation of AI (Kay, 2012). AI can be considered the future of human beings (Minsky, 2006), and in contrast to this AI can also be the reason for disasters in human life and also it may minimise humanity (Hawking et al., 2014). So, in this regard, the question arises "How do university teachers perceive artificial intelligence?".

According to Haseski (2019), pre-service teachers perceive both positive and negative roles of artificial intelligence in the field of education. According to Yeh et al., (2021), people perceive AI as both an opportunity and a risk for the sustainable development of human beings. The study also reveals that people were having high confidence in their knowledge related to the services and products of AI, and they were having a very positive attitude towards AI, but at the same time also some people considered AI risky. The study of AI in an educational context is an emerging concern in the present education system (Roll & Wylie, 2016), although research studies have been conducted since 1980 on AI in education (Self, 2016; Mohammed & Watson, 2019). Research studies related to AI in education reveal that teachers perceive the use of AI as a supporter of education and educational practices (Porayska-Pomsta, 2016; Edwards et al., 2018; Bracaccio et al., 2019). Teachers also perceive AI in terms of creating an intelligent instructional environment and system in the educational setting (Aleven et al., 2016; Chen et al., 2016; Greer & Mark, 2016; Dermeval et al., 2018). Studies on AI also reveal that AI has the potential for performance support and quality evaluation (Santos, 2016; Grivokostopoulou et al., 2017; Rahimi et al., 2017), it helps to discover the potentialities of students and fosters creativity, and also helps teachers to reduce workloads (Bajaj & Sharma, 2018; Liang & Chen, 2018; Xue & Li, 2018).

Most of the above studies focus on the implications of AI in the educational context, where almost all the literature supports the use of AI in education because of its feasibility, and some reveal the same in both positive and negative perspectives. On the other hand, it can be said that along with these potential benefits of AI in the educational context, there is a need to examine the usefulness of AI in the educational context based on the perceptions of the teachers who play a vital role in the implementation of AI in the educational context. As far as available literatures are concerned, a smaller number of studies have been found in the Indian context regarding the perception of university teachers toward AI. In this regard, the present study would be helpful to reveal the perceptions of university teachers towards AI with reference to the frequency of usage, services involved with AI, the significance of AI, and confidence in using AI, which would guide the use of AI in educational setting more efficiently.

Objectives Of The Study

1) To study the level of university teachers' perceptions of artificial intelligence
2) To study the independent and interaction effect of gender, locality, age, academic streams, and year of teaching experience on the perception of university teachers towards artificial intelligence

Hypothesis Of The Study

1) There exists no significant independent and interaction effect of gender, locality, age, academic streams, and year of teaching experience towards artificial intelligence.

Methodology

a) Method: In the present study, the investigators used the descriptive cum comparative method of research to investigate university teachers' perception of artificial intelligence descriptively and compare in terms of demographic variables. Along with this, the factorial design was also used to examine the interaction effects.

b) Participants: The total population of the study consisted of all the teaching staff (near about 400) of IFTM University, Moradabad**.** Out of which, 101 university teachers (near about 25.25%) of the University were taken into account randomly. First of all, three academic streams from the university were selected purposively i.e.,

Arts, Science, and Commerce, then the online link of the questionnaire was sent to all the faculty members of the three streams, and primary data was collected. The age group of the participants ranged from 25-51 years. The data was collected between March 2022 to April 2022. The responses sheet was analysed in terms of the nature of the response given by the participants. Both exclusion and inclusion criteria were followed strictly. Respondents who provided an incomplete response, repeated response, or false response were excluded from the study, and other respondents were included. The following table shows the variable-wise number of samples with percentage.

Table 1. Variable wise distribution of sample with N and percentages

Variables	Levels	N	Percentage
Gender	Male	60	59.4%
	Female	41	40.6%
Locality	Urban	75	74.25%
	Rural	26	25.74%
Age	Above average	53	52.48%
	Below average	48	47.52%
Teaching experience	High teaching experience	53	52.48%
	Low teaching experience	48	47.52%
Academic streams	Arts	33	32.67%
	Science	61	60.39%
	Commerce	07	6.93%

c) Instrument: A perception scale toward Artificial Intelligence was used to collect data. The perception scale towards AI developed by Yeh et al., (2021) was adapted and modified based on the objectives of the present study. The final version of the scale was having 17 items in total. The Cronbach's alpha reliability of the scale was 0.824. The content and face validity of the scale were examined by taking the views of subject experts.

d) Data Collection: In the present study primary data was collected in online mode by using *Google Forms*. First of all, permission was taken from the Directors of the respective streams, then the Online link was sent to all the faculties for the collection of data.

Results

The analysis and interpretation of the data were done in a phased manner as mentioned below.

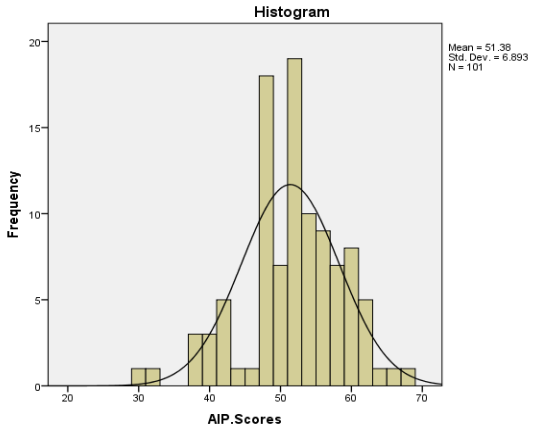
a) Testing Nature of Distribution of Data

Table 2. Results of normality tests

	Kolmogorov-Smirnov			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Perception scores towards Artificial Intelligence	.114	101	.002	.975	101	.048

The above table shows the results of two tests of normality i.e., Kolmogorov-Smirnov and Shapiro-Wilk. The table reveals that the statistical result of the KS test is significant at 0.01 level in terms of perception towards AI with df=101. But the result of the SW test was not significant at 0.01 level. Therefore, it can be assumed that the nature of the distribution of perceptions was normal.

Figure.1 Histogram showing normality of psychological richness data



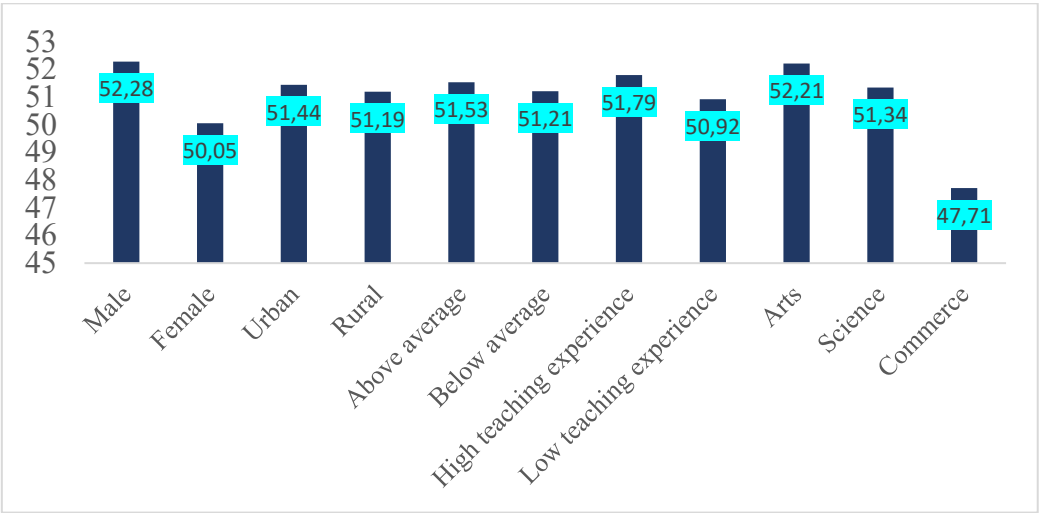
The histogram also shows the nature of the distribution, which is normal. As the nature of the distribution was assumed to be normal, parametric statistical tests like t-test, and ANOVA were used. The analysis and interpretation of the data were done in two major parts i.e., descriptive analysis, and analysis of independent and interaction effects of demographic variables.

b) Variable and parameter wise descriptive analysis

The descriptive analysis of the obtained data was done by using Mean, SD, and N concerning the demographic variables i.e., gender, locality, age, teaching experience, and academic streams. The results of the descriptive analysis are given below.

Table 3. Variable wise descriptive statistics of perception toward AI

Variables	Levels	Mean	Std. Dev.	N
Gender	Male	52.28	6.07	60
	Female	50.05	7.84	41
Locality	Urban	51.44	6.70	75
	Rural	51.19	7.58	26
Age	Above average	51.53	6.47	53
	Below average	51.21	7.40	48
Teaching experience	High teaching experience	51.79	7.38	53
	Low teaching experience	50.92	6.36	48
Academic streams	Arts	52.21	7.25	33
	Science	51.34	6.43	61
	Commerce	47.71	8.90	7



The above table and figure show mean scores of perception of university teachers towards AI with reference to demographic variables. The figure shows that there was a difference in the mean scores of perception of male and female university teachers towards AI, where the perception of male teachers was found to be higher than

female teachers. With regard to locality, it was found that there was a slight difference between the perception of rural and urban university teachers. The table also reveals that the teachers having higher teaching experience were having higher perceptions of AI as compared to teachers having lower teaching experience. As far as age is concerned, there were slight variations in the perception of teachers toward AI. With regard to academic streams, it was found that university teachers of Arts streams were having more positive perceptions followed by teachers of science and commerce streams.

Table 4. Percentage of perception of teachers about the frequency of use of AI

Sl.no	Specifications	Always	Often	Occasionally	Not at all
1.	How frequently do you use Artificial Intelligence products or services in your work or daily lives?	39 (38.61%)	36 (35.64%)	22 (21.78%)	4 (3.96%)
2.	How frequently do you actively understand the new trends in artificial intelligence products and services?	40 (39.60%)	33 (32.67%)	27 (26.73%)	1 (0.99%)
3.	How frequently do you actively learn the way to use Artificial Intelligence products or services?	43 (42.57%)	30 (29.70%)	23 (22.77%)	5 (4.95%)

The above table reveals the perception of university teachers toward AI in terms of its frequency of use. It reveals that about 38.61% of teachers always perceive that they frequently use AI products or services in their work, about 35.64% perceive that they often use AI, 21.78% perceived that they occasionally use AI, and about 3.96% perceive that they don't use at all. About 39.60% of teachers view that they always understand the new trends of AI products and services, 32.67% of teachers understand new trends often, and about 26.73% understand new trends occasionally. The table also reveals that about 42.57% of teachers always learn the way to use AI products and services, 29.70% learn often, and 22.77% learn occasionally. It is vivid that AI is being frequently used by university teachers.

Table 5. Percentage of perception of teachers about services involved with AI

Sl.no	Specifications	Tightly Involved	Moderately Involved	Slightly Involved	Not Involved at all
1.	Social Media(Facebook, Instagram) etc. are involved with Artificial Intelligence.	38 (37.62%)	40 (39.60%)	18 (17.82%)	5 (4.95%)
2.	Web browsers (Chrome, Firefox, Edge) etc. are involved with Artificial Intelligence.	62 (61.38%)	29 (28.71%)	7 (6.93%)	3 (2.97%)
3.	Mobile Payment (Phone Pay, Google Pay), etc. are involved with Artificial Intelligence.	48 (47.52%)	31 (30.63%)	15 (14.85%)	7 (6.93%)
4.	Health Management (Smart watch) etc. are involved with Artificial Intelligence.	41 (40.59%)	32 (31.68%)	18 (17.82%)	10 (9.90%)
5.	Home Appliances are involved with Artificial Intelligence.	21 (20.79%)	46 (45.54%)	23 (22.77%)	11 (10.89%)

The above table reveals the perception of university teachers about services involved with AI. The table shows that about 37.62% of teachers perceive that social media are tightly involved with AI, 39.40% perceive it as moderately involved, 17.82% perceive it as slightly involved and about 4.95% perceive it as not at all involved. As far as the involvement of AI with a web browser is concerned, about 61.38% of teachers perceive as tightly involved, 28.71% perceives moderately involved, 6.93% perceived slightly involved, and about 2.97% perceive it as not at all involved. About 47.52% of teachers perceive that mobile payments are tightly involved with AI, 30.63% perceive it as moderately involved, 14.85% perceive it as slightly involved and about 6.93% perceive it as not at all involved. With regard to the involvement of health management with AI, about 40.59% of teachers perceive as tightly involved, 31.68% perceive it as moderately involved, 17.82% perceive it as slightly involved and 9.90% perceive it as not at all involved. As far as the involvement of home appliances with AI is concerned,

about 45.54% of teachers perceive it as moderately involved, 22.77% perceive it as slightly involved, 20.79% perceive as tightly involved, and about 10.89% perceive it as not at all involved. From this data, it is clear that university teachers believe in active involvement in the services with AI.

Table 6. Percentage of perception of teachers towards the significance of AI

Sl.no	Specifications	Strongly Agree	Agree	Disagree	Strongly Disagree
1.	Artificial Intelligence improves the efficiency of human society and thus rules human beings.	33 (32.67%)	54 (53.46%)	12 (11.88%)	2 (1.98%)
2.	Artificial Intelligence allows people to have more time to realize their dreams.	23 (22.77%)	68 (67.32%)	10 (9.90%)	0
3.	Artificial Intelligence offers solutions to complicated problems.	37 (36.63%)	53 (52.47%)	11 (10.89%)	0
4.	Artificial Intelligence changes lay people's decision-making capacity.	28 (27.72%)	63 (62.37%)	10 (9.90%)	0
5.	Artificial Intelligence increases the unemployment rate.	20 (19.80%)	55 (54.45%)	24 (23.76%)	2 (1.98%)

The above table reveals the perceptions of university teachers about the significance of AI. The table reveals that about 53.46% of teachers do agree that AI improves the efficiency of human society that rules human beings, 32.67% strongly agree with it, 11.88% disagree with it and about 1.98% do not agree with it. About 67.32% of teachers agree that AI allows people to have more time to realize their dreams, 22.77% strongly agree with it, but 9.90% do not agree with it. About 52.47% of teachers do agree that AI offers solutions to complicated problems, 36.63% strongly agree with it, but 10.89% do not agree with the same. As far as the changes in the decision-making capacity of people due to AI is concerned, about 62.37% of teachers do agree with it, 27.72% do strongly agree, but 9.90% of teachers do not agree with it. With regard to the increase in the unemployment rate because of AI, about 54.45% do agree with it, 19.80% strongly agree with it, but 23.76% disagree with it and about 1.98 strongly disagree to the same. From the table, it is clear that most of the teachers do agree about the significance of AI in their life.

Table 7. Percentage of perception of teachers about confidence with AI

Sl.no	Specifications	Extremely Confident	Confident	Not Confident	Not Confident at all
1.	Personal data can be well protected through Artificial Intelligence.	10 (9.90%)	47 (46.53%)	39 (38.61%)	5 (4.95%)
2.	Automatic cars will not risk road safety.	8 (7.92%)	35 (34.65%)	53 (52.47%)	5 (4.95%)
3.	Artificial Intelligence can be used for military purposes.	32 (31.68%)	49 (48.51%)	16 (15.84%)	4 (3.96%)
4.	Artificial Intelligence will not decide to eliminate human being.	15 (14.85%)	45 (44.55%)	38 (37.62%)	3 (2.97)

The above table reveals the perception of teachers about their confidence in AI. About 46.53% of teachers are confident that personal data can be well protected through AI, but 38.61% are not confident about the same. About 52.47% of teachers are not confident that automatic cars will not risk road safety, whereas 34.65% are confident about it. As far as the use of AI for military purposes is concerned, about 48.51% of teachers are confident about the same, 31.68% are extremely confident, and 3.96 are not at all confident. About 44.55% of teachers are confident that AI will not decide to eliminate human beings, about 14.85% are extremely confident, but 37.62% are not confident about the same. From the table, it is clear that university teachers are having mixed responses regarding their confidence in AI.

c) Analysis of Independent and Interaction Effect

In the present study, five demographic variables were taken into account i.e., gender, locality, teaching experience, academic streams, and age of university teachers. By taking these variables both independent and interaction effects on the perception of university teachers were studied applying ANOVA.

Table 8. Sum of the square, df, mean square, F, and Sig. value of perceptions based on demographic variables

Factors	Sum of Square	df	Mean Square	F	Sig.	Remark
Gender	207.884	1	207.884	5.21**	.025	P<0.05
Locality	37.190	1	37.190	.93	.337	ns
Age	184.947	1	184.947	4.64**	.035	P<0.05
Teaching experience	108.830	2	54.415	1.37	.262	ns
Academic streams	139.759	1	139.759	3.58	.065	ns
Gender * Teaching experience	341.980	1	341.980	8.58*	.005	P<0.01
Locality * Teaching experience	174.248	1	174.248	4.37**	.040	P<0.05
Gender * Locality * Teaching experience	219.717	1	219.717	5.51**	.022	P<0.05

* significant at 0.01 level
** significant at 0.05 level
ns: not significant

Table-10 depicts the independent and interaction effect of demographic variables on the perception of university teachers towards AI. The F-values of perception of university teachers towards AI in terms of gender and age were found to be 5.21 and 4.64, which were significant at 0.05 level with df=1/72 and 2/72 respectively. Thus, there was a significant effect of gender and age on the perception of teachers towards AI. Based on the mean scores of perception in terms of gender, it was found that the mean score of male teachers was 52.28 which was significantly higher than females, so male teachers highly perceive AI as compared to females. The mean score of perception of teachers having above-average age was 51.53, which was significantly higher than teachers having below-average age, so it can be concluded that university teachers having above-average age highly perceives AI. However, the F-value of locality, teaching experience, and academic streams were not significant, so it was concluded that there was no significant effect of these variables on the perception of AI.

As far as the results of the factorial analysis are concerned, a significant interaction effect was found in the case of Gender * Teaching experience, Locality * Teaching experience, and Gender * Locality * Teaching experience. The following tables explain the results of significant interaction effects.

Table 9. Interaction effect of Gender and Teaching experience on the perception of teachers

Gender	Teaching experience	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Male	Low Teaching Experience	51.260[a]	1.685	47.902	54.618
	High Teaching Experience	53.474[a]	1.445	50.594	56.355
Female	Low Teaching Experience	49.114[a]	1.779	45.567	52.661
	High Teaching Experience	44.757[a]	1.909	40.952	48.562
a. Based on modified population marginal mean.					

The F-value of the interaction effect of gender and teaching experience was found to be 8.58, which was significant at 0.01 level with df=1/72. This revealed a significant interaction effect of gender and teaching experience on the perception of university teachers towards AI. Thus, the null hypothesis that there is no significant interaction effect of gender and teaching experience on the perception of teachers towards AI is rejected. Based on the mean scores of perception towards AI in terms of gender and teaching experience, it can be concluded that the mean scores of perception of male teachers having higher teaching experience were found to be 53.47, which is significantly higher compared to others. So, it can be said that male university teachers having higher teaching experience perceive AI highly.

Table 10. Interaction effect of locality*teaching experience on the perception of teachers

Locality	Teaching experience	Mean	Std. Error	95% Confidence Interval	
				Lower Bound	Upper Bound
Urban	Low Teaching Experience	50.410[a]	1.350	47.718	53.102
	High Teaching Experience	49.643[a]	1.415	46.823	52.464
Rural	Low Teaching Experience	50.125[a]	2.564	45.013	55.237
	High Teaching Experience	49.143[a]	2.053	45.051	53.234
a. Based on modified population marginal mean.					

The F-value of the interaction effect of locality and teaching experience was found to be 4.37, which was significant at 0.05 level with df=1/72. This revealed a significant interaction effect of locality and teaching experience on the perception of university teachers towards AI. Thus, the null hypothesis that there is no significant interaction effect of locality and teaching experience on the perception of teachers towards AI is rejected. Based on the mean scores of perception towards AI in terms of locality and teaching experience, it can be concluded that the mean scores of perception of urban teachers having lower teaching experience were found to be 50.41, which is significantly higher compared to others. So, it can be said that urban university teachers having lower teaching experience perceive AI highly.

Table 11. Interaction effect of Gender * Locality * Teaching experience on perception

Gender	Locality	Teaching experience	Mean	Std. Error	95% Confidence Interval	
					Lower Bound	Upper Bound
Male	Urban	Low Teaching Experience	49.952	2.008	45.949	53.956
		High Teaching Experience	53.277[a]	1.883	49.522	57.031
	Rural	Low Teaching Experience	53.875[a]	3.067	47.760	59.990
		High Teaching Experience	53.738[a]	2.250	49.254	58.223
Female	Urban	Low Teaching Experience	50.960[a]	1.737	47.497	54.422
		High Teaching Experience	46.010[a]	2.112	41.799	50.222
	Rural	Low Teaching Experience	44.500[a]	4.464	35.602	53.398
		High Teaching Experience	42.250[a]	3.866	34.544	49.956
a. Based on modified population marginal mean.						

The F-value of the interaction effect of gender, locality, and teaching experience was found to be 5.51, which was significant at 0.05 level with df=1/72. This revealed a significant interaction effect of gender, locality, and teaching experience on the perception of university teachers towards AI. Thus, the null hypothesis that there is no significant interaction effect of gender, locality, and teaching experience on the perception of teachers towards AI is rejected. Based on the mean scores of perception towards AI in terms of gender, locality, and teaching experience, it can be concluded that the mean scores of perception of male university teachers in rural areas having lower teaching experience were found to be 53.88, which is significantly higher as compared to others. So, it can be said that male university teachers in rural areas having lower teaching experience perceive AI highly.

Discussion, Limitation, Future Direction, And Conclusion

The descriptive analysis of the present study revealed mixed perceptions of university teachers towards AI, where some sorts of differences were noticed in the perceptions of teachers with reference to key parameters like frequency of usage, the significance of AI, confidence, and involvement with AI-based on demographic variables like gender, locality, age, teaching experience, and academic streams. But most teachers do agree that

AI has a significant contribution to human life in many aspects. These findings have been supported by different empirical evidence (Ekici, 2014; Adali, 2017; Baker & Smith, 2019; Haseski, 2019; Lathuiliere et al., 2019). In contrast to this, related research also revealed negative perceptions of the people about AI which were richer than the positive perceptions (Keles, 2021). It could be due to the thinking of people that AI applications are entering into human life rapidly and influencing their attitude, behaviour, and psychological constructs to a great extent.

The present study revealed a significant effect of gender and age on the perception of teachers towards AI, where it was found that the perceptions of make teachers and teaching having above-average age was significantly higher as compared to the other groups. This could be due to the frequency of using AI-related services and products in their daily life. However, the study revealed no significant effect of locality, teaching experience, and academic streams on the perceptions of teachers towards AI. These findings may be retested by taking a larger sample size and controlling the effect of other factors associated with it.

The present study also revealed that the perception of male teachers having higher teaching experience was significantly higher as compared to others. So, it was concluded that male university teachers having higher teaching experience perceive AI highly. The study also made it clear that the perception of urban teachers having lower teaching experience was found to be significantly higher as compared to others. So, it revealed that urban university teachers having lower teaching experience perceive AI highly. This could be due to the frequent use of technological devices embedded with AI by the fresher faculty members belonging from urban areas. As far as the locality is concerned, in urban areas, we notice advanced technological devices and supporting infrastructure in almost all fields, but in rural areas, it is not so. Similarly, if we analyze the age as a factor of AI, we see that previously people were not aware of the use of technological devices in all contexts, the development of its uses occurred gradually, so the teachers having higher age may not have developed a more positive attitude towards AI.

Further, the present study also reveals that the perception of male university teachers in rural areas having lower teaching experience was found to be significantly higher as compared to others. So, it was concluded that male university teachers in rural areas having lower teaching experience perceive AI highly. Here, we can hypothesize that rural male teachers having lower teaching experience may be using and enjoying smartphones to a great extent and able to do most complicated work very easily i.e., booking a ticket, online payment, communication, acquainted with news, etc. because of AI. So, they might have developed a sense of positivity towards AI.

However, it is noticed that people often demonstrate various meanings to the concept of artificial intelligence in different ways (Haseski, 2019), but most of the studies made it clear that AI is based on independent decision making depending upon situational characteristics (Kulkarni & Joshi, 2015; Chand, 2018; Verma & Kumar, 2018), which assist to make human life convenience (Mishra, 2011; Warwick, 2012; Kaplan, 2016). The analysis of related kinds of literature and the findings of the present study revealed that people are having both positive and negative emotions regarding AI, but in the case of people of higher age negative emotions are noticed higher as such people do not wish to live their life in such technological context. It is a fact that studies revealed AI as a risk for personal and social life (Russell et al, 2015; Scherer, 2015), but still, some people feel happy to live with AI happily. Apart from these, studies also reveal the opportunities provided by AI to a great extent in terms of solving problems of human life and bringing welfare to human life (Skouby & Lynggaard, 2014; Kopec et al., 2016). As far as the perception of teachers in this study is concerned, we found that teachers are in favour of AI for the benefit of human beings, this finding was supported by empirical pieces of evidence (Sotala, 2012; Sen, 2018). On the other hand, some studies are against AI and consider it risky (Muller, 2016, Parnas, 2017; Turchin & Denkenberger, 2018).

Moreover, this present study has some limitations also, that in the study only working teachers working in IFTM University were taken into account as a sample, and demographic variables like gender, locality, age, teaching experience, and academic streams were taken into account. So similar studies can be conducted by taking a larger sample size and taking teachers and students of a diverse group of different areas. Qualitative studies can be undertaken regarding the perception of teachers and students about AI and in-depth data may be gathered for the same. Teachers working at different levels of education may be taken into consideration and a mixed-method study can be done in this regard. Experimental studies can be undertaken to examine the effectiveness of AI in terms of the educational achievement of students and the teaching competence of teachers.

Based on the findings of the present study it can be said that AI is having wide educational implications, particularly for teachers and students in the educational context with reference to lesson planning, lecturing, classroom-related activities, constructivist learning, individualized instruction, analyzing strength and weakness,

managing classroom, evaluating teaching and learning, etc. (Liang & Chen, 2018; Catlin & Blamires, 2019; Mu, 2019). Realizing the development of technological interventions in the present context, it can be suggested that AI has the potential to make human life easy and develop work culture in the organization, but its regulative use is the need of the hour for the benefits of the mass. The study of AI should be included in the curriculum of higher education students. appropriate training should be given to the teachers to use AI in an educational context in a regulative way.

Author contribution

Dr. Singh conceived the research ideas and prepared the introductory section. Dr. Tiwari assisted in the fieldwork of data collection in online mode and requested the participants for giving their valuable responses in time. Dr. Meher, Dr. Tiwari, and Ms. Yadav did the scoring, analyzed the data, and completed the reporting section in all aspects. All authors read and approved the final manuscript.

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No potential conflict is reported in the study.

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ATTITUDE OF REGULAR AND NON-REGULAR STUDENTS TOWARDS OPEN AND DISTANCE EDUCATION

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ABSTRACT
In the present study investigator wants to find out the attitude of regular and non-regular students towards open and distance education. The objectives of the study were to find out the attitude of regular and non-regular students towards open and distance education concerning different strata. The investigator framed four null hypotheses according to the objectives of the study. A purposive sampling technique was used for sample selection and a total of 353 regular and non-regular students were selected as samples for the study. Investigator developed and standardized a tool to measure the attitude of students towards open and distance education. After the collection of data, 't' test was used for testing hypotheses. Out of four hypotheses, three hypotheses were accepted and one was rejected. So, it was found that there existed mode (regular and non-regular), gender-wise and stream-wise significant differences and there found no existed locality-wise significant difference among the students with respect to their attitude towards open and distance education.
Keywords: Regular, Non-regular, Student, Open and Distance Education.

Introduction

As a form of non-formal education open and distance education is fast becoming an accepted and integral part of the mainstream of education systems in both developed and developing countries. India is the second largest population country in the world. Due to overpopulation and poverty, most of the people are uneducated. Due to the largest population in India, regular mode of education does not provide to all people and formal education is not sufficient for covering education for all. Open and distance education is a tool to overcome such challenges. Distance education solves urgent based issues (Bozkurt & Sharma, 2020). Open and distance education provides many opportunities in developing countries like India for the realization and spread of education. Open and distance education and regular mode education is a similar and popularized concept in India. Open and distance education is popularized from time to time. It is a learner-centred, upgraded, self-learning-based education where the learner can learn based on their thinking, needs and ways. All aspects of distance education, including admission to examinations are flexible (Ahamad & Aqil 2015). Students from all over the world have open access to the hybrid and extensive interactive courses offered by many universities through distance education. (Grandzol, 2006). Like formal education distance education is not restricted to age, class, qualification and regular attendance for degree. It explores interest, motivation and self-passing among learners. Open and distance learning needs skills upgrading and teaching more and more subjects at a distance; no need to attend regular classes, students can attain anywhere from the world. Distance education is expressed daily, and open universities play an important role in the education system (Ahamad & Aqil 2015). For the successful implementation of the programmes for the target group, it is necessary to investigate the attitude of the students. So, in this present study investigator wants to investigate the attitude of regular and non-regular students towards open and distance education.

Review of Related Literature

Sharma (2017) observed on attitude and perception of postgraduate students towards Distance Learning to find out the attitude and perception of postgraduate students. A descriptive survey approach was used for the study. The sample consisted of 120 IGNOU students and a purposive sampling technique was used. The findings indicated that found no significant difference in attitude and perception between the male and female postgraduate students towards distance learning and found a significant difference in attitude and perception between the urban and rural postgraduate towards distance learning.

Ahamad & Aqil (2015) investigated on attitudes towards distance education among graduate students to compare the attitudes of engineering and B. Sc. students towards distance education. 200 graduate students were considered as a sample. The self-made questionnaire was used for data collection. Findings indicated that found no difference in male and female graduate students' attitude towards distance education.

Kaban (2021) examined the attitudes of university students towards distance education. Survey method as well as quantitative method was used in this present study. A total of 764 university students were selected as sample. The Attitude Scale towards Distance Education was used for data collection. Results indicated that attitude towards distance education differ in terms of gender and grade level of students.

Objectives of the Study

The following are the objectives of the present study:

- To find out the attitude of regular students towards open and distance education with respect to different strata (gender, locality and streams).
- To find out the attitude of non-regular students towards open and distance education with respect to different strata (gender, locality and streams).

Hypothesis of the Study

According to the objectives of the study, researcher formulated following hypothesis:

- $H_{0.1}$: There exists no significant difference in the mean scores of attitude towards open and distance education between Regular and Non-regular students.
- $H_{0.2}$: There exists no significant difference in the mean scores of attitude towards open and distance education between Male and Female students.
- $H_{0.3}$: There exists no significant difference in the mean scores of attitude towards open and distance education between Rural and Urban students.
- $H_{0.4}$: There exists no significant difference in the mean scores of attitude towards open and distance education between Arts and Science students.

Methodology of the Study

Researcher used quantitative method and Descriptive Survey approach for conducting the present study.

Variables: Researcher determined main variable of the present as:

- Attitude of Regular and Non-regular students.

Categorical variables:

- Gender (Male and Female)
- Locality (Rural and Urban)
- Streams (Arts and Science)

Sample: A total number of 353 from 179 regular and 174 non-regular students in different Universities were used as a sample. The judgemental sampling technique was employed to choose the samples and data was collected by the standardized questionnaire. The sample distribution is shown in table 1:

Table 1: Showing the sample's distribution

		Regular Students		**Non-regular Students**		**Total**
Streams		**Arts**	**Science**	**Arts**	**Science**	
Locality	**Rural**	M-20	M-23	M-21	M-22	**86**
		F-21	F-24	F-22	F-20	**87**
	Urban	M-23	M-21	M-24	M-23	**91**
		F-25	F-22	F-21	F-21	**89**
Total		**89**	**90**	**88**	**86**	**N= 353**

M= Male, **F**=Female

Tool Used:

Investigator developed a questionnaire to measure attitude towards open and distance education. A total of 40 test items were chosen after item analysis. When the items were determined to be sufficiently important for the current investigation and the Cronbach Alpha technique was used to measure reliability and validity, then the investigator finalized the questionnaire.

Definition of Terms:

Attitude: In this study investigator used the term 'attitude' positive and negative views of students towards open and distance education.

Regular Student: In this study investigator used the term 'regular' are students who were getting education from regular mode in different Universities in India.
Non-regular Student: In this study investigator used the term 'non-regular' are students who were getting education from open and distance modes in different open Universities in India.

Analysis and Interpretations of Data
After gathering data, the investigator used several descriptive and inferential statistics to analyse and interpret the data. Researchers employed descriptive statistics like Mean, Standard Deviation (SD), Standard Error of Mean (SEm), and inferential statistics like a 't'-test to compare regular and non-regular students among the variables under investigation in the current study.

Table 2: Attitude of regular & non-regular students towards open & distance education

Mode	*N*	*Mean*	*SD*	*SEm*	*df*	*'t' value*
Regular	179	113.69	8.66	0.64	351	**4.12****
Non-regular	174	117.65	9.39	0.71		

****Significant at 0.01 level**
The estimated 't' value in Table 2 above was determined to be significant, hence the related null hypothesis ($Ho._1$) was rejected. Therefore, it can be inferred that between regular and nonregular students there is a significant difference in the mean score of attitudes towards open and distance education. The mean value for non-regular students compared to regular students was higher.

Table 3: Attitude of male & female students towards open & distance education

Gender	*N*	*Mean*	*SD*	*SEm*	*df*	*'t' value*
Male	177	114.55	8.64	0.65	351	**2.20***
Female	176	166.69	9.60	0.72		

***Significant at 0.05 level**

The estimated 't' value in Table 3 above was determined to be significant, hence the related null hypothesis ($Ho._2$) was rejected. Therefore, it can be inferred that between male and female students there is a significant difference in the mean score of attitudes towards open and distance education. The mean value for female students compared to male students was higher.

Table 4: Attitude of rural & urban students towards open & distance education

Locality	*N*	*Mean*	*SD*	*SEm*	*df*	*'t' value*
Rural	173	115.16	8.85	0.66	351	0.93
Urban	182	116.07	9.50	0.71		

The estimated 't' value in Table 4 above was determined not to be significant, hence the related null hypothesis ($Ho._3$) was accepted. Therefore, it can be inferred that between rural and urban students there is no significant difference in the mean score of attitudes towards open and distance education. The mean value for urban students compared to rural students was higher.

Table 5: Attitude of arts & science students towards open & distance education

Streams	*N*	*Mean*	*SD*	*SEm*	*df*	*'t' value*
Arts	177	117.37	9.81	0.73	351	**3.62****
Science	176	113.88	8.19	0.62		

****Significant at 0.01 level**

The estimated 't' value in Table 4 above was determined to be significant, hence the related null hypothesis ($Ho._4$) was rejected. Therefore, it can be inferred that between arts and science students there is a significant difference in the mean score of attitudes towards open and distance education. The mean value for arts students compared to science students was higher.

Findings of the Study

After analysis of the hypothesis investigator found the following findings:

- Found that there was a significant attitude score difference in the mean towards open and distance education between regular and non-regular students. The mean value for non-regular students compared to regular students was higher.
- Found that there was an important difference between male and female students' attitudes about open and distance education. The mean value for female students compared to male students was higher.
- Found that there was no significant difference between rural and urban students' attitude towards open and distance education. The mean value for urban students compared to rural students was higher.
- Found that there was an important difference between arts and science students' attitudes towards open and distance education. The mean value for arts students compared to science students was higher.

Conclusion

An important element of the current education system is open and distance education. Based on the above results investigator concluded that the majority of sampled students had positive attitude towards open and distance education and non-regular students had favourable attitude than the regular students. The attitude towards open and distance education among female students was more positive than that of male students. Compared to the rural students, urban students had a more favourable attitude toward open and distance education. In comparison to science students, those studying the arts showed a more favourable attitude toward open and distance education. The present study helps to know about the attitude of regular and non-regular students towards open and distance education among different strata. The results of this study will be helpful to teachers, policymakers, educators and other academicians to improve open and distance education in future.

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ATTITUDE TOWARDS BLENDED TEACHING-LEARNING APPROACH: A STUDY ON POST GRADUATE LEVEL STUDENTS

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ABSTRACT
Blended learning is one of the essential learning methods for enhancing and developing an individual's creative skills in education. It is a method of learning that uses current technology and incorporates a variety of strategies in a manner that is appropriate for students. The descriptive survey method was used to determine attitudes towards the blended teaching-learning approach. The researcher also used a random sampling technique based on a Likert Three-point scale to collect data from 313 PG-level students from West Bengal. The investigators used a self-created questionnaire (ATBTLA) to examine attitudes toward the blended teaching-learning approach. For data analysis, the investigator developed a research model and graphical representation to represent the attitude towards the blended teaching-learning approach and used SPSS-23 to compute the Mean, S.D., t-test, and ANOVA. The present study revealed that most students (68.89%) scored between 56.038 and 66.019, indicating a moderate attitude towards the blended learning approach among Post Graduate level students. It also found that most students were satisfied with the blended teaching-learning process. The results reveal that the PG level students' attitude towards the blended teaching-learning approach is no significant difference based on Gender(0.101, $p>0.05$), Residence (0.568, $p>0.05$), Family type (1.058, $p> 0.05$), Semester at university (1.302, $p> 0.05$), Nature of course(1.531, $p> 0.05$), Nature of internet access (0.343, $p> 0.05$), Devices used for learning (0.043, $p> 0.05$), Their experience of using the blended mode to get learning (0.813, $p>0.05$) towards the blended teaching-learning approach.
Keywords: Blended learning, Teaching-learning, Attitude, satisfaction, Post Graduate students.

Introduction

Blended learning has been a popular teaching and learning strategy in recent years, with several educational institutions worldwide adopting it (Wani & Dalvi, 2013). Blended learning is seen as alternative teaching and learning strategy that enables teachers to solve a fundamental problem in online interaction that is the need for more familiarity with conventional face-to-face interactions between students and teachers (Kuo et al., 2014). Blended learning is a form of teaching that uses online communication tools, web-based content, and a learning management system to enable teachers to balance the amount of in-class and computer-internet-based learning (Mulyono et al., 2007). Students gain from this balance because they have access to dependable learning materials and may study at their speed, communicate with teachers, and track their progress. One of the possible advantages of the blended learning strategy is that it reduces the gap between attending face-to-face and online classes (Kuo et al., 2014). It might be any learning program in which more than one delivery modality is employed to enhance educational results and reduce program delivery costs (Natividad et al., 2021).

In summary, it refers to a kind of education that combines face-to-face and online delivery techniques (Chew et al., 2010). Because it mixes the conventional classroom method with the online learning paradigm, blended learning is appealing and practical (Yılmaz & Malone, 2020). Blended learning's mode of delivery provides learners with an efficient and effective educational experience, with the added benefit of increased learner accessibility to programs; thus, the blended model can be used in novel ways to improve both student learning outcomes and instructional delivery costs (Dziuban et al., 2004). Students' communication skills increase due to blended learning, which allows for student-teacher exchanges and accelerates student-teacher involvement in both traditional and online environments (Kumar et al., 2017). Students could speak with their professors and other classmates beyond class, giving teachers and students the freedom to organize their learning, monitor their progress anytime they were, and have consciousness of their learning.

The learner and the lecturer should be physically present in a blended learning setting. Despite this, students should be able to utilize digital tools to exert some control over the pace or themes of their learning (Devi et al., 2021). A comparable approach is the flipped learning model, which uses technology to rearrange the learning experience and maximize crucial face-to-face interaction in the classroom. In a flipped classroom, students

would be encouraged to use a cloud-based learning platform to access digital learning resources on their own time. Before each lesson, resources such as video lectures, podcasts, recordings, and articles would be offered to transfer most of the essential information from teacher to student. This saves up class time for educators to assist students in activities, conduct discussions, and encourage student participation (UGC, 2020).

Review Of Related Literature

In this study, the researcher reviewed and reported on the majority of relevant studies conducted in India and abroad on the attitude towards blended learning approach among Post Graduate students.

In a study by Korkmaz & Karakus, (2009) revealed that blended learning models had a greater impact on students' attitudes toward geography classes than traditional learning models, as well as a positive relationship between students' attitudes toward geography classes and their rational thinking levels. Another research by Johnson, (2013) indicated significant differences in the overall opinions of the student groups about blended and online learning. Acar, (2013) found that attitudes regarding using social media for academic purposes were not connected to using other kinds of online learning techniques or getting experience with a Facebook-type page. Wani & Dalvi, (2013) discovered that exposing foundation year students to blended learning activities positively impacted their engagement, contentment with the teacher's role, and test performance while studying English. In a study on perceptions and attitudes toward blended learning, Hassan, (2015) found that students were satisfied with the method because it improved their English language proficiency and made learning English more cooperative, engaging, and enjoyable. A different investigation by AlAbdulkarim & Albarrak, (2015) indicated that students valued collaborative learning more than any other. The findings showed that students had a favourable attitude and were very motivated about the blended approach of teaching research courses. According to Angadi, (2016), there were no significant differences in B.Ed. student-teachers perceptions of blended learning based on their gender or academic level. Most prospective teachers have a positive attitude toward blended learning, and prospective female teachers are substantially more so than their male colleagues (Khan, 2016). Obaidat, (2016) investigation found that teachers' attitudes regarding implementing blended learning in the elementary stage were highly statistically significant (3.79). Lalima & Dangwal, (2017) suggested that blended learning implementation is effective and requires diligent efforts, the appropriate mentality, sizable funding, and strongly motivated instructors and learners. Alzahrani & Toole, (2017) revealed that pupils have both experiences utilizing the Internet and a favourable opinion about it. Interesting exchanges surrounding the student study year included positive and negative responses to Internet use and a preference for integrated learning. According to the findings of another research by Birbal et al., (2018), instructors believed that technology and learning flexibility were the most significant or valued aspects of blended learning. Additionally, there were notable differences in the students' opinions depending on their gender and part-time or full-time employment level. Akbarov et al., (2018) research demonstrated that students like blended learning in EFL use over conventional classroom instruction, and there is also a positive correlation between these preferences. Bakeer, (2018) discovered that students' opinions about incorporating blended learning seemed to have a favourable impact on improving their language abilities, independent development, and learner engagement. The studies of Aladwan et al., (2018) showed that blended learning benefits learners and that most participants completely comprehend the objectives of e-learning when they participate in blended learning. Nortvig et al., (2018) revealed numerous aspects, such as educator involvement in virtual interactions and interactions between students, instructors, and material. They intended links between offline and online and between campus-related and training activities. Blended learning is more suitable than conventional learning (Ikhwan & Widodo, 2019). Another study by Karaaslan & Kılıc, (2019) revealed that top achievers tended to favour blended learning. Students demonstrated strong preferences for the perception and notions of blended learning, according to Vaksalla et al., (2019). The usefulness of using evolving ICT tools, strategies, and approaches as a new, inventive kind of online instruction and learning platform was discovered by Dahal et al., (2020). Rahman et al., (2020) conducted a study and discovered that blended learning via the i-Learn platform provides excellent flexibility, allowing students to learn anytime and anywhere. Saboowala & Mishra, (2020) indicating that blended learning for school teachers' professional development after the pandemic would push the frontiers of learning by fostering international cooperation between diverse educational societies. This study relied on the interactive impact of the highest education level of the educator and the instructors who have applied education and instruction via online line sessions. Abbacan-Tuguic, (2021) identified technological weaknesses, which include the absence of educational devices and erratic internet access, which limit the effective application of blended learning adaptation. In another study Jnr, (2022) demonstrated that social variables, including usage, difficulty, work satisfaction, lengthy effects, enabling circumstances, and IT experience, greatly impact lecturers' perceptions of adopting BL efforts to enhance educational tasks in higher education. Falah & Chairuddin, (2022) revealed that 76.3% of students responded that they were happy with the integration of blended learning, indicating that this was a good viewpoint from the students.

Considering all of these factors, the researchers felt that there is a gap in which more research must be conducted to study in-depth outcomes about the attitude towards the blended teaching-learning approach. Therefore, the researchers choose this particular study.

Research Questions

- What is the level of attitude of postgraduate students towards blended teaching learning?
- What is the level of satisfaction of postgraduate level students towards blended teaching learning?
- How is the attitude differing towards blended learning based on gender, residence, family type, semester etc.?

Research Objectives

- To study the level of attitude of Post Graduate students towards the blended mode of teaching and learning.
- To study the level of satisfaction of Post Graduate students towards the blended mode of teaching and learning.
- To find out the mean difference of their attitude towards blended teaching-learning based on gender, residence, family type, semester, nature of the course, nature of internet access, their experience of using the blended mode to get learning, and the devices used for learning.

Hypothesis Of The Study

$H0_1$: There exist no significant mean differences regarding attitude towards blended teaching-learning based on gender.
$H0_2$: There exist no significant mean differences regarding attitude towards blended teaching-learning based on residence.
$H0_3$: There exist no significant mean differences regarding attitude towards blended teaching-learning based on the family type.
$H0_4$: There exist no significant mean differences regarding attitude towards blended teaching-learning based on semester.
$H0_5$: There exist no significant mean differences regarding attitude towards blended teaching-learning based on the nature of course.
$H0_6$: There exist no significant mean differences regarding attitude towards blended teaching-learning based on the nature of internet access.
$H0_7$: There exist no significant mean differences regarding attitude towards blended teaching-learning based on their experience of using the blended mode to get learning.
$H0_8$: There exist no significant mean differences regarding attitude towards blended teaching-learning based on the devices used for learning.

Methods And Participants

The present study was a survey-based descriptive study. The researcher has selected only 313 students from different departments of Post Graduate level students of Uttar Dinajpur district, W.B., as a sample. The researcher also used random sampling techniques for selecting the sample. The investigator extensively used SPSS 23 to analyze the Mean, S.D, t-test, and ANOVA.

Tool used for the study

To test the hypotheses, the investigator developed a scale on Attitude towards the Blended Teaching Learning Approach of the Post Graduate level students (ATBTLA). The ATBTLA of the post graduate students was assessed based on a 3-point Likert scale from 1 to 3, similar to the previous investigations conducted and used by Hassan, (2015); Obaidat, (2016); Yulia, (2017); Aladwan et al., (2018); Bakeer, (2018); Abbacan-Tuguic, (2021); Fenech et al., (2021); Falah & Chairuddin, (2022); Nyaaba & Sandawey, (2022). The questionnaire was constructed with 30 items which were distributed into eight dimensions, i.e., teaching-learning process (3 items), learning activities (4 items), psychological aspects (5 items), curriculum (3 items), technological facilities (5 items), efficiency of teacher (4 items), performance of the learners (3 items), evaluation process (3 items).

Data Collection Procedure

In order to begin gathering data, the Raiganj University was chosen randomly in the district of Uttar Dinajpur, West Bengal. Following that, the investigators notified the authorities and the pertinent PG students of each department well in advance for the purpose of data gathering. The researcher created online questionnaires using Google Forms, and the questionnaire was distributed via WhatsApp, Email, and other social media platforms. Before and throughout the data-collecting procedure, the students received clear instructions on how to complete questionnaires. In the end, 313 completed responses were gathered using the random sample approach. However,

10 responses were turned down due to specific issues with incompleteness. After gathering and sorting the surveys, the investigators evaluated all of the questionnaire questions using the direct and reverse scoring methods. Positive items were scored using the direct technique (Agree-3, Neutral-2, Disagree-1), while negative items were scored using the reverse method (Agree-1, Neutral-2, Disagree-3).

Results Of The Study

A) Level of the attitude of the Post Graduate students towards the blended learning approach:

Table1: Mean, SD of the level of attitude scale

Group	Number	Mean	S.D
Post Graduate students	313	61.029	4.9906

For determining the level of attitude

M ±σ

M + σ = 61.029+ 4.9906= 66.019

M - σ=61.029 - 4.9906 = 56.038

Table 2: Represent the level of attitude among the Post Graduate students towards the blended learning approach

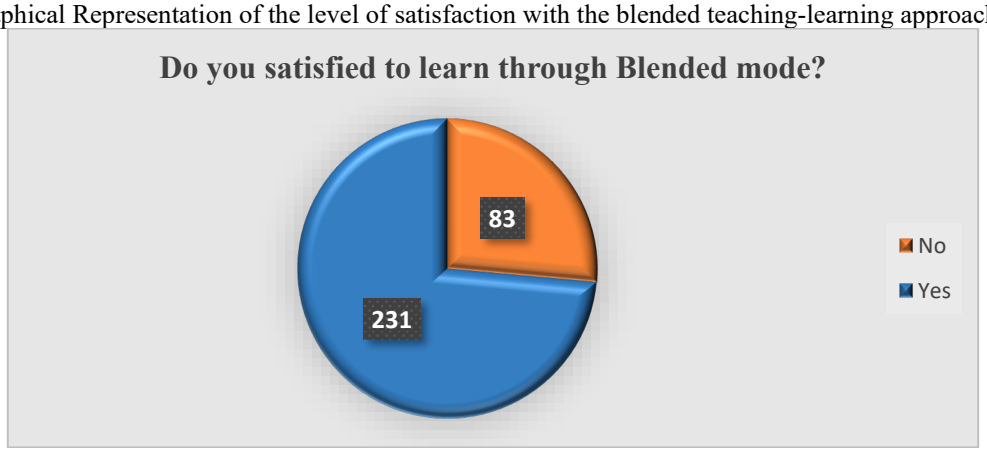
Scores	Frequency	Percentage	Level of Attitude Towards Blended Learning
≥ 66.019	50	15.97%	**High**
Between 56.038to 66.019	215	68.89%	**Moderate**
≤ 56.038	48	15.33%	**Low**
Total	**313**	**100%**	

Source: Primary data (collected by Researcher, 2023)

Based on the above table, we can observe that out of the total 313 Students, 50 (15.97%) of students have scored above 66.019, 215 (68.89%) Students have scored between 56.038 to 66.019, and 48 (15.33%) students have scored below 56.038 on the attitude scale towards blended learning. Therefore, the majority of students (68.89%) scored between 56.038 and 66.019, indicating a moderate attitude towards the blended learning approach among Post Graduate level students (Mahato et al., 2021).

B) **Level of satisfaction of the Post Graduate students towards the blended teaching-learning approach:**

Fig 1: Graphical Representation of the level of satisfaction with the blended teaching-learning approach



Source: Primary data (collected by Researcher, 2023)

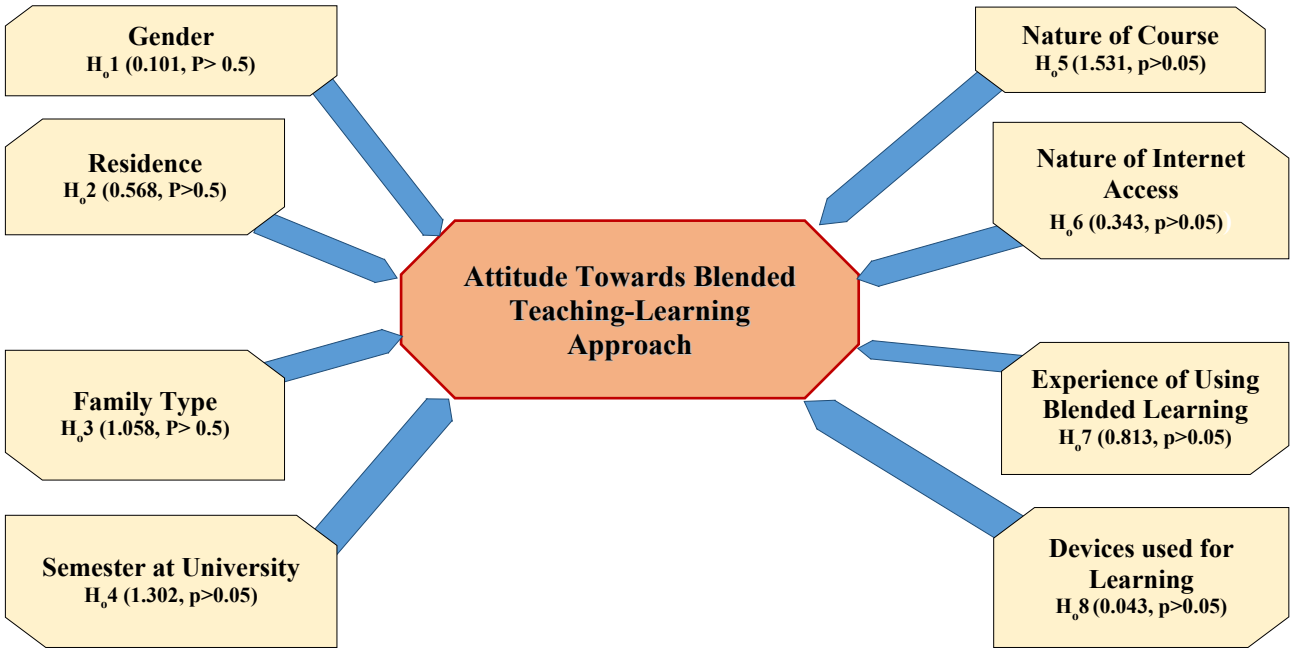
The above figure shows that out of 313 students, 231(73.80%) students responded with yes regarding their level of satisfaction with blended teaching-learning. On the other hand, 83 (26.51) students responded against no. So, most of the students are satisfied with the blended teaching-learning approach.

Table 3: Number, Mean, SD and t-test regarding different demographic variables

Demographic Variables		Number (N)	Mean (M)	SD (σ)	df	Mean Difference	SED	t-value	Sig. (2-tail)	Remarks*
Gender	Male	**156**	**61.00**	**4.81**						
	Female	**157**	**61.05**	**5.17**	**311**	**.0573**	**.565**	**0.101**	**.919**	**(p>0.05)***
Residence	Rural	**184**	**61.16**	**5.40**						
	Urban	**129**	**60.83**	**4.34**	**311**	**.3258**	**.573**	**0.568**	**.570**	**(p>0.05)***
Family Type	Nuclear	**228**	**60.84**	**5.25**	**311**	**.6712**	**.634**	**1.058**	**.291**	**(p>0.05)***
	Joint	**85**	**61.51**	**4.17**						
Semester at University	1st sem	**153**	**60.65**	**5.29**	**311**	**.6712**	**.563**	**1.302**	**.194**	**(p>0.05)***
	3rd sem	**160**	**61.38**	**4.66**						
Access to the Internet at home	Yes	**293**	**61.00**	**5.06**	**311**	**.3966**	**1.155**	**0.343**	**.732**	**(p>0.05)***
	No	**20**	**61.40**	**3.84**						
Their experience of using the blended mode to get learning	Yes	**253**	**60.91**	**5.12**	**311**	**.5830**	**.717**	**0.813**	**.417**	**(p>0.05)***
	No	**60**	**61.50**	**4.38**						

Source: Primary data (collected by Researcher, 2023)

Fig 2: Research Model of SPSS Analysis



Source: Primary data (collected by Researcher, 2023)

Gender and Attitude towards BL:
Table 3 and figure 2 shows that the determined 't'-value is 0.101, less than the critical value at 0.05 level of significance with 311 degree of freedom. There is no significant difference in the attitudes of male and female students toward the blended learning approach. The data from table 3 also shows that the mean value of male groups and female groups are 61.00 and 61.05, respectively S.D are 4.81 and 5.17, respectively. It is reasonable to conclude that attitudes regarding blended learning among PG male and female students are similar.

Residence and Attitude towards BL:
Table 3 and figure 2 shows that the determined 't'-value is 0.568, less than the critical value at 0.05 level of significance with 311 degree of freedom. There is no significant difference in the attitudes of rural and urban students toward the blended learning approach. Besides, the mean value of Rural and Urban students is 61.16

and 60.83, respectively S.D are 5.40 and 4.34. It is reasonable to conclude that attitudes regarding blended learning among PG rural and urban students are not much different.

Semester and Attitude towards BL:
Table 3 and figure 2 shows that the determined 't'-value is 1.302, which is less than the critical value at 0.05 level of significance with 311 degree of freedom. There is no significant difference in the attitudes of the 1st semester and 3rd semester students towards the blended learning approach. However, the mean value of 1st semester and 3rd semester groups are 60.65 and 61.38, respectively S.D are 5.29 and 4.66, respectively.

Access to the Internet and Attitude towards BL:
Table 3 and figure 2 shows that the determined 't'-value is 0.343, which is less than the critical value at 0.05 level of significance with 311 degree of freedom. There is no significant difference in the attitudes towards the blended learning approach based on access to the internet at home. The data from table 3 also shows that the mean value of access to the internet (Yes) and access to the internet (No) are 61.00 and 61.40, respectively S.D are 5.06 and 3.84, respectively.

Experience of using BL and Attitude towards BL:
Table 3 and figure 2 shows that the determined 't'-value is 0.813, which is less than the critical value at 0.05 level of significance with 311 degree of freedom. There is no significant difference in the attitudes towards blended learning based on their experience of using the blended mode to get learning. Besides, the mean value of their experience of using the blended mode to get learning was not much different.

Table 4: Number, Mean and SD in attitude towards blended learning approach based on the nature of course and devices used for learning

Variables		Number (N)	Mean (M)	SD (σ)
Nature of Course	**Language**	**49**	**61.347**	**5.1298**
	Science	**218**	**61.206**	**5.0599**
	Social Science	**46**	**59.848**	**4.4119**
Devices used for learning	**By using Smartphone**	**193**	**60.974**	**5.4548**
	By using Laptop/Desktop	**75**	**61.173**	**4.2215**
	By using Tab/Notepad	**45**	**61.022**	**4.0926**

Source: Primary data (collected by Researcher, 2023)

Table 5: The significant mean differences regarding attitude towards blended learning based on the nature of course and devices used for learning

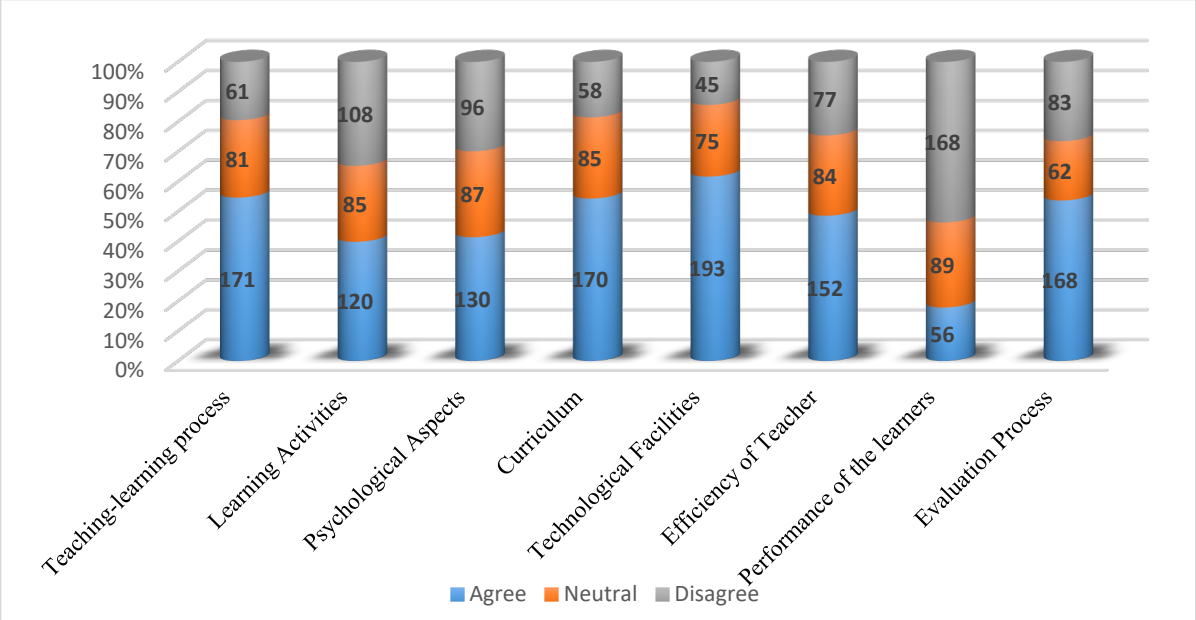
Result of ANOVA based on Nature of Course					
Sum of Squares		**Mean Square**		**F-value**	**Sig.**
Between Groups	**Within Groups**	**Between Groups**	**Within Groups**		
75.993	**7694.748**	37.997	**.218**	**1.531@**	**.218**
Result of ANOVA based on Devices used for learning					
2.146	**7768.595**	**1.073**	**25.060**	**.043@**	**.958**

Source: Primary data (collected by Researcher, 2023)

@ Not Significant [Table Value of 'F' against df-310/2, 310/2 at 0.05 and 0.01 level of significance]
*At 0.05 level of Significance 3.03
*At 0.01 level of significance 4.68

The above table and figure 2 shows that the calculated ***F-value*** is less than the critical value at 0.01 and 0.05 level of significance. Therefore, the null hypothesis is failed to reject at both level of significance. Hence, there is a no significant mean difference based on the nature of course and devices used for learning with respect to their attitude towards the blended learning approach.

Fig 3: Dimension-wise attitude towards blended teaching-learning approach among post graduate level students



Source: Primary data (collected by Researcher, 2023)

The eight dimensions of attitude towards the blended teaching-learning approach by post graduate students are depicted in the diagram above. In this first-dimensional graphical representation, students are dealing with the teaching-learning process. The majority of the students have given positive responses. In the second dimension, 120 students (out of 301 total) responded positively to learning activities. On the other hand, 130 students responded positively to psychological aspects regarding blended mode. Besides, many post graduate students believe that a curriculum organized through blended mode is very well. In the technology facilities dimension, 193 students responded positively to agree, while 75 students responded neutral, and 45 responded negatively with technological facilities. In the fifth dimension, most students positively responded to the teacher's efficiency. After that, the graphical representation reflects a critical aspect of the learner's performance that most students struggle with the conceptual clarity of their respective courses. In another area, the majority of students were satisfied with the evaluation process in the blended teaching-learning process. Therefore, it is clear that most students support the blended teaching-learning approach.

Discussion And Conclusion

The present study revealed that most students (68.89%) scored between 56.038 and 66.019, indicating a moderate attitude towards the blended learning approach among Post Graduate level students supported by (Mahato et al., 2021). It also found that most students were satisfied with the blended teaching-learning approach. Besides this, it is also revealed that there is no significant difference in the attitudes based on Gender (0.101, $p > 0.05$) supported by (Tongpoon-Patanasorn & White, 2020), Residence (0.568, $p > 0.05$) supported by (Jnr, 2022), Family type (1.058, $p > 0.05$), Semester at university (1.302, $p > 0.05$), Nature of course (1.531, $p > 0.05$), Nature of internet access (0.343, $p > 0.05$) (Mahato et al., 2021), Devices used for learning (0.043, $p > 0.05$), Their experience of using the blended mode to get learning (0.813, $p > 0.05$) towards blended teaching-learning approach supported by (Hapuarachchi, 2016). It is reasonable to conclude that attitudes regarding blended learning among PG students are similar (Das, 2021).

Besides, the eight dimensions of attitude towards the blended teaching-learning approach by post graduate students revealed that the majority of the students had given positive responses. The study also revealed that 120 students (out of 301 total) responded positively to learning activities (Lim & Morris, 2009). On the other hand, 130 students responded positively to psychological aspects regarding blended mode. Besides, many post graduate students believe that a curriculum organized through blended mode is very well. In the technology facilities dimension, 193 students responded positively to agree, while 75 responded neutral and 45 responded negatively with technological facilities (Gumennykova et al., 2020). After that, the graphical representation reflects a critical aspect of the learner's performance that most students struggle with the conceptual clarity of their respective courses. In another area, the majority of students are satisfied with the evaluation process in the blended teaching-learning process (Sieweng & Muuk, 2015). Therefore, it is clear that most students support the blended teaching-learning approach.

According to the findings, students believed that providing the course in a blended style made it easier to follow and boosted their learning. The online material was well-illustrated and simple to comprehend. The online activities boosted engagement and were well structured regarding goals and duration. It is critical that the course's intended learning objectives align with the online activities in order to ensure that the two elements are linked. Every course should be introduced in blended mode. Blended learning necessitates a deliberate approach to instructional design such that the program is blended in design, not merely in delivery.

Limitations Of This Study And Future Research

In this study, the investigator chose only 313 students to post graduate level students at Uttar Dinajpur district of W.B., India. The study was restricted to enrolled samples of PG 1st and 3rd semester students. Also, the investigator only used the descriptive survey method for data collection and analyzed the data accordingly.

In order to achieve better content validity, future research may consider using additional items and dimensions. Also, further study can be carried out on challenges regarding blended teaching learning in secondary-level students from different parts of the country. Also, future studies could include more universities and larger samples from different areas.

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Disclosure of Conflict Interest

The authors declare that they have no conflicts of interest.

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CHALLENGES OF ONLINE TEACHING OVER FACE-TO-FACE TEACHING DURING COVID-19: PERCEPTION OF PRIMARY SCHOOL TEACHERS

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ABSTRACT
This research was conducted on 40 primary school teachers of Delhi and U.P. to study the challenges of online teaching that occurs during the situation like COVID-19 pandemic. Data was collected through google forms. The findings disclosed various pedagogical, financial, socio-psychological, in assessment and evaluation and technological challenges of online teaching faced by teachers like not being able to manage online classes, spending money on basic infrastructure like internet connectivity, devices and, power source and equipments, finding online examinations less effective than physical face-to-face examinations. Furthermore, the data also yielded several inputs to overcome difficulties that a teacher faces in the online classroom, such as ICT skills training, stable internet connection and students' seriousness about studying etc.
Keywords*:* Online Teaching, Face to Face Teaching, Challenges, COVID-19, Primary School Teachers, Perception

Introduction

Novel Corona virus pandemic started proving to be serious for education. It struck at a point when educational institutions in India were not prepared for online education. So, to maintain the continuity of teaching-learning government took step for online education. Though this step was the most apt to address the need of the time it has created a difficult routine for teachers who are working from home while simultaneously assuming responsibility for ensuring that their students' learning continues in a consistent manner during pandemics. One of the most significant challenges of online education is the changing role of teacher from a face-to-face instructor to an online instructor. So, effectively transfer of teaching from the face-to-face classroom to online is a problem. Furthermore, communication challenges may also exist like the effectiveness of communication due to language barriers and communication through various technological modes can be dealt under pedagogical problems. Moreover, teachers in a physical classroom can draw cues from non-verbal communication with their students which might be difficult to take when the teacher is unable to see their students' faces. Additionally, teachers have been teaching face-to-face for a long time and are hesitant to teach in an online mode. So, comfort level of teachers with technology, as well as their internal opinions of towards online education influences their teaching in online environment (Kebritchi et al., 2017).

Therefore, the purpose of this research study is to study the challenges face by teachers due to sudden shift from face-to-face teaching to online teaching during COVID times. Many studies have identified and examined important issues like communication, technology, time management, pedagogy, and assessment which are affecting quality of online education. But, in this study, six different areas were taken into account to identify challenges associated with the change from face-to-face to online teaching:

1) **Pedagogical area:** It refers to the way content is developed and provided to the students, as well as change in teaching, engaging students in different activities, classroom control and management, etc.
2) **Financial area:** It deals with effects and side-effects of shifting to online teaching due to Covid-19.
3) **Socio-psychological area:** It includes the social relationships a teacher establishes with the students, and social as well as psychological effect of face to face to online shifting on him/her.

4) **Assessment and Evaluation area:** It comprises of changing ways of assessment and evaluation of students' progress and its effects on learning.
5) **Readiness area:** It relates to preparedness of teachers for online classroom environment, which includes teaching, teachers' comfortability, and ability with technology, as well as administrative and organizational responsibilities.
6) **Technological area:** It includes the technological glitches and problems a teacher has to face while teaching online.

Context Of The Study

The study looked at primary school teachers of Delhi and U.P. These are two Indian states located in north central part of the country. A primary teacher normally teaches students studying in grades one through five.

Need For The Study

Due to COVID-19 situation, education institutions were quick to exchange face-to-face lectures with online teaching to restore continuity of teaching and learning, and communication between teachers and students as far as possible (Karalis, 2020). So, teachers also had to adapt to latest modes of delivery of teaching and also pedagogical concepts, for which they may not have been trained. Murzello (2020) described a 54-year-old government-aided school teacher in Mumbai who had a few classes on Zoom and now Google Meet and is having trouble sending invites. She feels terrified, nervous, and has a restless sleep. The other key challenge pointed out in the study of Jain et al. (2020) was that online education necessitates a unique type of pedagogy that most instructors are unfamiliar with. The researchers also pointed out that school teachers believed they are digitally skilled but knowing how to use technology is not the same as having the pedagogical expertise required to teach online. Rasmitadila et al. (2020) found the challenge that students' participation in learning activities is not optimal and as much as in face-to-face learning. Furthermore, the application of SFH that was school from home has posed obstacles in terms of establishing online learning systems, particularly in terms of facility use and infrastructure availability, which has been minimal till now. Various problems included the provision of school infrastructure like the cost of obtaining expensive data packages, as well as the internet network that not all schools have previously had access to, especially in villages. Student involvement in educational activities was hampered by data packages, ownership of cellular phones or laptops, and students' eagerness to study. According to Kebritchi et al. (2017), 45% of the respondents have prior knowledge about online teaching and do not face any challenges. However, only a few have insufficient digital training, expertise, and awareness of digital tools and applications. Karalis and Raikou (2020) clearly stated that at students were filled with intense negative feelings and, to a lesser extent, fleeting joy as universities closed. Bhamani et al. (2020) found that majority of teachers felt negative emotions which mainly included stress, anxiety and sadness. Izhar et al. (2021) stated that teachers lacked the knowledge and abilities needed to transform offline (hardcopy) materials to online (softcopy) materials and disseminate them on social media platforms. So, due to a lack of experience in online teaching, teachers lacked online teaching skills.

Thus, the studies and documents on challenges of sudden shift from teaching face to face to online that have been reviewed above brings out varied findings. It was also felt that it is a relatively new, recent, and relevant topic. Although researches are done on it at a very fast pace in other countries and international level but not much has been done in Indian scenario; especially on primary school teachers. Hence, it seemed of great importance to conduct present research by taking following objectives into consideration:

1. To study the challenges faced by teachers due to sudden shift from traditional classroom to online classroom
2. To collate suggestions of teachers for overcoming the difficulties faced during online teaching

Research Methodology

This study comprised of total 40 primary school teachers that were chosen on the basis of convenience sampling. Out of which 20 teachers were selected from Delhi Schools (5 teachers × 4 schools) and 20 teachers were selected from U.P. (5 teachers × 4 schools). Furthermore, to achieve the objectives of this study questionnaire was developed by the researchers by selecting items from the studies of Gupta (2018), Karalis (2020), Rasmitadila et al. (2020), Kim (2020), Jain et al. (2020), Deka & Anand (2021), and McCurdy et al. (2020). The questionnaire consisted of 33 close-ended questions related to challenges faced by teachers due to sudden shift from traditional classroom to online classroom. 5-point Likert scale was used for close ended questions. These questions were further divided into 6 dimensions namely: Pedagogical, Financial, Socio-Psychological, Assessment and Evaluation, Readiness, and Technological. In addition, teachers were also asked one open-ended question. Data of close-ended questions was analysed through online spreadsheets and MS Excel using percentages once it was collected online. For the analysis of open-ended question, themes were identified by the researchers. Analysed data was presented in the form of tables and chart.

Findings

Here, objective wise results of the study are given below.

Objective 1: To study the challenges faced by teachers due to sudden shift from traditional classroom to online classroom

This objective is categorised into pedagogical, financial, socio-psychological, assessment and evaluation, readiness, and technical dimensions by the researchers. Teachers' responses were gathered on a 5-point Likert scale.

a) Pedagogical challenges

Table 1: Responses of primary teachers about pedagogical challenges faced by teachers due to sudden shift from traditional classroom to online classroom

S. No.	Statements	Always	Often	Sometimes	Rarely	Never
1	You have more control in face-to-face class than online classroom.	50%	20%	25%	0%	5%
2	You have a feeling of alienation from the entire class due to one way communication happening most of the time in online class.	30%	27.5%	40%	2.5%	0%
3	You think learning process is not carried out optimally in online teaching.	17.5%	25%	37.5%	17.5%	2.5%
4	You need experience to engage children in online classes from various backgrounds.	27.5%	22.5%	40%	5%	5%
5	You find ineffectiveness in brainstorming activities and group discussions in online classes.	17.5%	22.5%	52.5%	5%	2.5%
6	You face difficulty in concentrating on individual learner in online classes.	20%	45%	15%	17.5%	2.5%
7	You face difficulty in participating and engaging students in online classes.	15%	25%	45%	12.5%	2.5%
8	You think lack of effective communication skills leads to total failure of online classes.	17.5%	25%	35%	12.5%	10%

Table 1 shows that majority of the respondents (50 %) stated that they always have more control in face-to-face class than online classroom, whereas 17.5% of them reported that learning process is not carried out optimally in online teaching rarely. 45% of the teachers stated that they often face difficulty in concentrating on individual learner in online classes. More than half of the teachers (52.5%) answered that they sometimes found ineffectiveness in brainstorming activities and group discussions in online classes. Meanwhile, 40% of the participants sometimes have a feeling of alienation from the entire class due to one way communication. 15% of the total number of teachers always faced difficulty in participating and engaging students in online classes. However, there were only 3% participants who mentioned that they never faced difficulty in participating and engaging students in online classes.

b) Financial challenges

Table 2: Responses of primary teachers about financial challenges faced by teachers due to sudden shift from traditional classroom to online classroom

S. No.	Statements	Always	Often	Sometimes	Rarely	Never
1	You require investing money to access necessary devices like cell phones/laptops/computers.	25%	32.5%	25%	5%	12.5%
2	You require investing money to get reliable power source.	22.5%	37.5%	17.5%	12.5%	10%
3	You require investing money to access resources like Wi-Fi for internet connectivity.	30%	30%	25%	7.5%	7.5%
4	You require purchasing expensive data packages for the purpose of conducting online classes.	27.5%	37.5%	20%	7.5%	7.5%

Table 2 indicates that 25% of the teachers always require investing money to access necessary devices, while only 5% teachers rarely have to invest money to access necessary devices. Whereas 30% of the respondents always require to invest money to access resources like Wi-Fi, and 37.5% of the respondents often have to purchase expensive data packages for the purpose of conducting online classes. However, 10% teachers mentioned that they never require investing money to get reliable power source.

c) Socio-psychological challenges

Table 3: Responses of primary teachers about socio-psychological challenges faced by teachers due to sudden shift from traditional classroom to online classroom

S. No.	Statements	Always	Often	Sometimes	Rarely	Never
1	Face to face class brings in more interaction between student and you than online classroom.	57.5%	12.5%	20%	5%	5%
2	Lack of hands-on experience leads to anxiety and confidence losing.	25%	20%	40%	10%	5%
3	You have anxiety about when and how syllabus will be completed.	17.5%	32.5%	22.5%	10%	17.5%
4	Online teaching evokes negative emotions like fear, nervousness, scariness, distress in you.	10%	22.5%	42.5%	0%	25%
5	Continuously looking at screen leads to headache and eye pain.	32.5%	35%	17.5%	2.5%	12.5%
6	You are less enthusiastic with SFH (school from home) than with face-to-face learning.	37.5%	15%	32.5%	10%	5%

Table 3 reveals that majority of the teachers (57.5%) answered that face-to-face class always brings in more interaction between student and them than online classroom, while only 5% reported that face to face class never brings in more interaction than online classroom. Moreover, 22.5% teachers sometimes underwent anxiety about when and how syllabus will be completed. Of all the respondents, only 10% participants stated that online teaching always evokes negative emotions like fear, nervousness, scariness, distress in them, but 25% of the respondents never felt such negative emotions. Additionally, 37.5% of the participants mentioned that they are always less enthusiastic with SFH (school from home) than with face-to-face learning. Some teachers (35%) often felt continuously looking at screen leads to headache and eye pain, whereas only 2.5% of the teachers rarely felt this problem.

d) Assessment and evaluation challenges

Table 4: Responses of primary teachers about assessment and evaluation challenges faced by teachers due to sudden shift from traditional classroom to online classroom

S. No.	Statements	Always	Often	Sometimes	Rarely	Never
1	You find it easy to conduct presentation, case study, role play, group discussion in face-to-face class than online teaching.	27.5%	37.5%	30%	2.5%	2.5%
2	You feel mode of submission of assignments is more effective in face-to-face teaching than online teaching.	37.5%	20%	32.5%	5%	5%
3	Checking homework of entire class sent through photographs/pdf is cumbersome and time consuming.	50%	20%	22.5%	2.5%	5%
4	Checking assignments of entire class sent through photographs/pdf is cumbersome and time consuming.	47.5%	20%	25%	2.5%	5%
5	Since you cannot interact physically with students, so you cannot gauge students' understanding when teaching online.	27.5%	27.5%	37.5%	2.5%	5%
6	Mode of examinations is more effective in face-to-face teaching than online teaching.	45%	20%	25%	5%	5%

Table 4 shows that 37.5% of the teachers often found it easy to conduct presentation, case study, role play, group discussion in face-to-face class than online teaching, while only 2.5% of them rarely found it easier to conduct

presentation, case study, role play, group discussion in face to face class than online teaching. Half of the teachers (50%) reported that checking homework of entire class sent through photographs/PDF is always cumbersome and time consuming, whereas only 5% teachers reported that checking homework of entire class sent through photographs/pdf is never cumbersome and time consuming. Moreover, 37.5% of the respondents reported that since they cannot interact physically with students, so sometimes they cannot gauge students' understanding when teaching online. However, 45% of the participants mentioned that mode of examinations is always more effective in face-to-face teaching than online teaching.

e) Readiness challenges

Table 5: Responses of primary teachers about readiness challenges faced by teachers due to sudden shift from traditional classroom to online classroom

S. No.	Statements	Always	Often	Sometimes	Rarely	Never
1	Lack of prior exposure to skills related to online teaching.	17.5%	22.5%	47.5%	10%	2.5%
2	You are not familiar with knowledge of new and latest technology as well as teaching methods to deliver effective online classes.	12.5%	27.5%	37.5%	12.5%	10%
3	Online classes are inconvenient in-home setup.	35%	17.5%	27.5%	12.5%	7.5%
4	Due to the lack of specialized training, you are mostly unfamiliar with particular issues of online pedagogy and struggle to teach online.	20%	20%	30%	20%	10%

Table 5 reveals that 47.5% of the teachers answered that sometimes they feel lack prior exposure to skills related to online teaching. Furthermore, 27.5% of the respondents stated that they are often not familiar with knowledge of new and latest technology as well as teaching methods to deliver effective online classes. Whereas, due to the lack of specialized training, 30% of the participants sometimes feel unfamiliar with particular issues of online pedagogy and struggle to teach online, however, only 10% of the participants never feel that they are not familiar with knowledge of new and latest technology to deliver effective online classes. Moreover, 35% of the total teachers reported that online classes always inconvenient in-home setup, while 12.5% reported that online classes are inconvenient in home setting rarely.

f) Technological challenges

Table 6: Responses of primary teachers about technological challenges faced by teachers due to sudden shift from traditional classroom to online classroom

S. No.	Statements	Always	Often	Sometimes	Rarely	Never
1	You face lack of required technology to show and explain topics to students in online classroom.	15%	35%	35%	5%	10%
2	Wastage of time and classes owing to network and technical glitches and power problems are quite common.	17.5%	45%	25%	7.5%	5%
3	You face difficulties in using ICT may come from the gap between skills you learn in your educational programs and ICT that you are expected to use in teaching now.	17.5%	22.5%	47.5%	5%	7.5%
4	Lack of sufficient ICT knowledge and skills to teach primary classes.	12.5%	32.5%	32.5%	15%	7.5%
5	Lack of proper internet connectivity.	22.5%	30%	30%	10%	7.5%

Table 6 reveals that 35% of the total number of teachers often faced lack of required technology to show and explain topics in online classroom; meanwhile only 5% respondents had to deal with a shortage of needed technology in the classroom on a rarely basis. Only 5% participants reported that they never face time and class disruptions due to network and technical issues, as well as power outages. However, 47.5% teachers said they have difficulty utilising ICT because there is a gap between the skills they learn in school and the ICT they are required to use in the classroom now. Further, 15% of the teachers mentioned that they rarely feel lack of

sufficient ICT knowledge and skills to teach primary classes. In addition, lack of proper internet connectivity always experienced by 22.5% of the participants but only 7.5% of the participants never experienced lack of proper internet connectivity.

Objective 2: To collate suggestions of teachers for overcoming the difficulties faced during online teaching

In the first open ended questions, participants were asked to suggest ways of overcoming the difficulties faced during online teaching. Following are the responses provided by them.

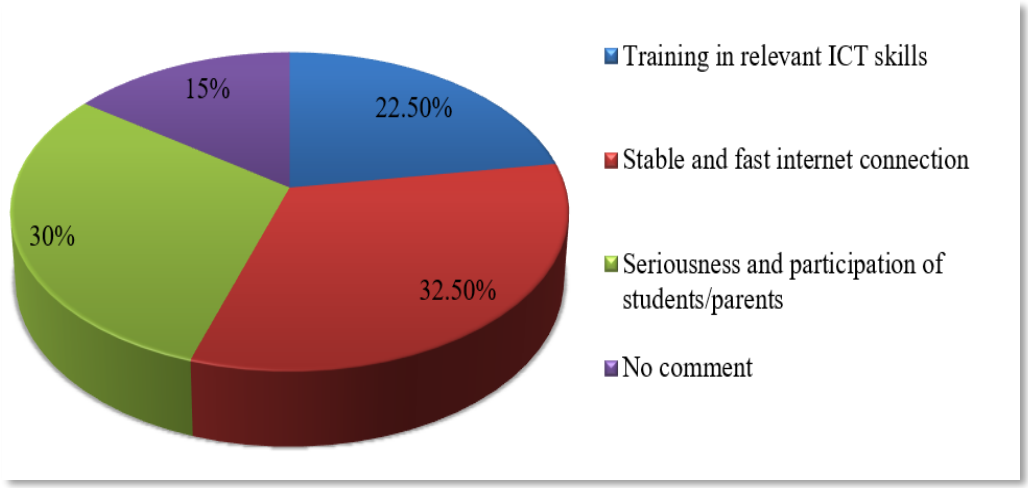

Figure 1: Responses of teachers suggesting ways of overcoming difficulties faced by them during online teaching

The findings given in figure 1 show that, 32.50% teachers said stable and fast internet connection will lead to overcoming the difficulties they face during online classes. However, 30% of the teachers suggested that seriousness and participation of students and parents in online classes can lead the effectiveness of online teaching. While 22.50% of the teachers claimed that they require hands on training in relevant ICT skills to meet the current needs of online teaching. 15 % participants did not give any suggestion.

Discussion

Findings of the current study's **Pedagogical dimension** reveal that most of the teachers stated that they have difficulty in concentrating on individual student as well as learning process is not carried out optimally in online teaching. So, this finding shows congruence with those of Rasmitadila et al. (2020) who also mentioned that students' participation in online learning activities is not as high as it is in face-to-face learning. As per the results of **Financial dimension**, online teaching requires to spend money on basic infrastructure like internet connectivity, devices, and power source by majority of teachers. This finding of the present study show similarity with by Jain et al. (2020), where the results showed teachers that offer online classes need to invest money in order to have access to technology, which includes having the appropriate gadgets, internet access, and a reliable power source. So, providing appropriate funding to assist online teaching expenditures for teachers in need should be a top priority. The **Socio-psychological dimension** reflects that online teaching have a grave impact on teacher's socio psychological condition. Majority of teachers reported that face to face classes bring in more interaction with the students. They also stated that online teaching led to headache and eye pain due to continuously looking at screen. As well, online teaching develops negative emotions and anxiety among them. The finding is consistent with Bhamani et al. (2020) who also found negative emotions among teachers which mainly included stress, anxiety and sadness that arose due to the closure of institutions as a result of the COVID-19 epidemic. Therefore, teachers should be provided with emotional and psychological distressing support and activities by school. Furthermore, results of the **Assessment and evaluation dimension** disclose that most teachers found it tougher to conduct presentation, case study, role play, group discussion in online classes than in face-to-face classes. Whereas only a very small number of teachers did not found checking homework of entire class sent through photographs/PDF cumbersome and time consuming while the rest of them did. Teachers also reported their failure in gauging the level of understanding of students when teaching online. Therefore, professional development and guidance should be offered with training to identify and help pupils that require particular attention. The findings emerged from **Readiness dimension** of this research uncovered that even if teachers are digitally proficient, but this does not guarantee that they have expertise to teach in online settings. They were not skilled to take online classes prior to change from face-to-face to online schooling. This finding is in coherence with Izhar et al. (2021) found in his study that teachers had little actual experience of teaching

online before the school closed. So, it was difficult to them to take an online class which was also found in the present study. Findings also contradict with Kebritchi et al. (2017) which found that 45 percent of participants had prior knowledge and are not facing any difficulties. Only few respondents, however, have stated that they had insufficient digital training, expertise, or awareness of digital tools and applications. Hence, in service teachers should be provided skills to deal with an unseen situation like COVID pandemic. Findings of the **Technological Dimension** points out that majority of teachers face technological difficulties in online classes, such as lack of sufficient ICT knowledge and skills, power cut offs, and wastage of time and classes due to network and technical issues. So, the government should ensure proper towers and provision for free and stable internet connections.

Conclusion

It is concluded that teachers had little time to prepare for an alternative method of instruction due to the abrupt and unforeseen changeover from face-to-face to online teaching. Therefore, their skills are not matched with online educational settings. It is also found that even if teachers are digitally savvy, this does not guarantee that they are able to teach online classes or produce materials that are suitable for online environment. Moreover, it implies that teachers have not been given with any supportive infrastructure like devices or internet facilities from school. So, they have to invest money on it themselves. Other challenges that arise as a result of the move from face-to-face to online teaching are spending money on basic infrastructure such as internet connectivity, devices, power sources, and equipment, considering online assessments to be less effective than physical face-to-face examinations, not being able to manage online classes, not having prior experience in online teaching, as well as unpleasant feelings and anxiety. In such a situation, grading and evaluating kids' learning becomes rather hazy, as there is always the possibility of students receiving family support in order to achieve good grades. It is also found that majority of the teachers think that training in relevant ICT skills, stable and fast internet connection along with seriousness and participation of students/parents can overcome these difficulties.

Suggestions For Future Studies

At the end, the study suggested areas on which future studies can be done:

- A similar study can be conducted by keeping school as well as university students.
- A study can be conducted on similar lines by keeping role of school and parents of students.
- A similar study can be conducted on different educational institutions, areas, rural and urban regions other than Delhi and U.P.

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EFFICACY OF OPEN AND DISTANCE LEARNING: LEARNERS AND FACILITATORS PERSPECTIVES FROM THE OPEN UNIVERSITY OF TANZANIA

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ABSTRACT
This study assessed the efficacy of Open and Distance Learning (ODL) through the Open University of Tanzania (OUT). It revealed the learners and facilitators' perceptions on ODL, adequacy of facilitation strategies and the support services offered in relation to learners' demographic factors. Sample size was 149 and SPSS software was used for statistical analysis. Pearson correlation test (at 0.001 and 0.05 levels of significance) was carried out to test the influence of demographic factors on the respondents' perception on the ODL support services that OUT provides to students. The results showed that demographic variables such as age, marital status, degree program and year of study have influence on respondents' perception on the efficacy of ODL. Also, the pedagogical and andragogical strategies used by OUT were found to be effective in transforming learners. Support services were found to be effective, with a mean of 1.79 and a standard deviation of 0.95. Therefore, nurturing and supportive learning environment must consider sex, age, degree program and marital status. It should also focus on more strengthening of support services, teaching and learning strategies.
Key Words: Perspectives, efficacy, Open and Distance Learning, andragogy, pedagogy.

Introduction

Efficacy means the ability to do what is defined as desired or to be effective in producing the intended results (Mampane, 2015). Thus, education is considered to have efficacy if it produces individuals who are not only knowledgeable but capable of solving immediate problems in their society. In Tanzania, the efficacy of education has constantly been questioned by different people. A lot of complaints concerning the effectiveness of the Tanzanian educational system have been mounted by different stakeholders, many of them blaming the education offered by different institutions in the country for failing to enable the learners to deal with our day-to-day problems, i.e. for being is ineffective in producing problem solvers (MoEST, 2022). In relation to distance learning, there are even more complaints which cast doubt over the academic ability of graduates who pursue their studies through Open and Distance Learning (ODL). Scholars who raise these complaints consider graduates from Open and Distance Learning institutions as weaker in terms of knowledge and skills compared to their counterparts from the conventional institutions. Open and Distance Learning (ODL) is described as the learning that takes place while the learner and the teacher are distant from each other (Freeman, 2004; Moon et al., 2005; Perraton, 2012; Ramanujan, 2002; Waghid, 2002). Essentially, ODL is seen as multidimensional and is aimed at bridging the gaps related to the time constraint, geographic constraints, economic constraints, educational needs, and the communicative distance between students and peers, students and academics, and students and coursework (UNISA, 2008). Ramanujan (2002) points out that the provision education through ODL makes use of several media to bridge the gap between students and teachers, students and materials as well as students and their peers. According to Purnell et al. (1996), the provision of education through ODL is facilitated through personal support offered by tutors through telephone, audio cassettes and video tapes that supplement the study material. Moon et al. (2005) and Mahai (2014) argue that the efficacy of ODL would improve if all the necessary conditions are met and thus distance and time are well managed.

Tanzania is among the African countries that have been administering Open and Distance Learning (ODL) since the 1970s. ODL is offered by different institutions in Tanzania but the biggest player in the field is the Open University of Tanzania (OUT) which in the academic year 2020/2021 enrolled around 46,728 (Facts Figures, 2020/2021), a number that cannot be enrolled by any other university in Tanzania within a single year. Therefore, OUT plays a great role in expanding access to education for the majority of Tanzanians and East Africans in general. OUT uses two modes of teaching and learning, namely: the blended mode and the online-learning mode. The use of these two modes is meant to give learners flexibility in their participation in higher education. ODL has become significant as a modern educational development that saves cost and time, hence enabling a big number of people to participate in learning (URT, 2014). Along with URT (2014), educators and learners consider it as an alternative way to meet the unmet demands for education, especially for those who want to pursue studies while continuing with their employment due to time and space limitations (Bryman, 2006). Komba (2009) considers ODL as an efficient alternative mode of delivering university education to the majority of Tanzanians. The aim of ODL therefore can be viewed in the lens of improving access to higher education (Bozkurt et al., 2016). Based on this, it has been argued that, for ODL to be successful, the future ODL

(especially in developing countries), it must benefit from a critical analysis of its operating environment and the focus has to shift from campus learning to home-based learning in order to reduce the knowledge gap among different groups of people (Mbukusa, 2009).

Essentially, effective provision of education through ODL depends on the capacity to cater for students' needs from different locations of the country. Different learning conditions such as location, availability of support services are liable to affect the learning efficiency (Bozkurt et al., 2019). Previous studies (Daniel, 2010; Dzakiria, 2005; Krishnan, 2012; Sewart, 1993; Tait, 2000, 2003) mention the provision of support services as a core in facilitating ODL. Srivastava and Reddy (2007) hold that students' effective and successful completion of studies through ODL is dependent on a combination of factors, which include learning materials, assignments, face-to-face support, efficacy of ODL centers, peer groups, guidance from counselors and access to library services. Furthermore, another consideration in enhancing the efficiency of ODL is to improve communication through ICT (Busulwa & Bbuye, 2018; Douce, 2018; Nankanja & Bisaso, 2010). Nonetheless, ensuring these services are adequately available for the learners has been challenging in many countries, especially those in Sub-Saharan Africa.

There is research evidence indicating that the provision of education through ODL has normally been fraught with a number of challenging issues. According to Basaza et al. (2010), for instance, it is constrained by lack of adequate skills and knowledge among both the academic and support staff. Other studies such as (Bwire et al., 2015; Kishore, 2014 and Nyerere et al., 2012) have mentioned lack of supportive skills among the trainers to be hampering ODL. Bhalalusesa (2001) observe that poor infrastructure, inadequate financial resources, poor learning environment and shortage of qualified tutors restrict effective provision of ODL. Therefore, there are important questions on the way key players perceive ODL efficacy, its adequacy and strategies as well as support services offered by ODL institutions.

Efforts to improve ODL have been made through different programmes, for example ICT training for learners and facilitators, installation of different online platforms in different academic institutions. Despite all these efforts, less has been studied in relation to the way learners and facilitators perceive the efficacy of ODL mode in the context of OUT. For example, the study by Bhalalusesa (2001) paid less attention to the efficacy of ODL in higher learning institutions in Tanzania. Therefore, this paper was specifically aimed at finding out how learners perceive the efficacy of ODL, the adequacy of andragogical and Pedagogical Strategies, and learners' support services used in ODL. To bridge these gaps, this study strongly recommends improvement of ODL practices in other institutions offering distance learning in Tanzania and globally.

2.0 Methodology

This study employed a mixed research approach where qualitative and quantitative research paradigms were employed. The qualitative approach was employed to explore facilitators' perceptions on the efficacy of ODL since the approach deals with the meanings people construct as they make sense of the world and experiences in their daily life. On the other hand, the quantitative approach was employed in respect of the descriptive and inferential statistics generated from students. This was suitable to the fact that the research required a large sample and statistical information was considered important in justifying the findings of the study. A convergent parallel research design was used. The design was preferred because of its ability to approximate the prevalence of the outcomes of interest for a given population (Levin, 2006). The target population of the study comprised all facilitators and students from OUT. The Open University of Tanzania was selected by virtue of being the leading ODL institution in the country and therefore its facilitators and students were assumed to possess relevant information regarding how ODL operates through different modes of delivery.

The study involved a total of 144 students and five facilitators from OUT. The students were selected by using convenience sampling due to the fact that students of ODL do not study on campus. Thus, those who were available on campus for whatever reason were requested to fill in the questionnaire. However, the facilitators were selected using purposeful sampling. Every student who was found at the headquarters was requested to fill in the questionnaire while the facilitators were interviewed at their convenience. Only active/live students were considered for filling in the questionnaire.

OUT's headquarters was selected due to the possibility that an adequate number of students could be readily available there most of the time and could offer timely cooperation. A five-point Likert scale questionnaire (ranging from 1=strongly agree to 5=strongly disagree) was used. The items used in the questionnaire were adopted from Claudio (2017) by the researcher and were accompanied with an interview guide for facilitators. Thematic data analysis was used to analyze the qualitative data generated from interviews while descriptive statistics and Pearson correlation test were used to analyze the quantitative data from the Likert-scale using SPSS

computer software version 22. Inferential statistics was performed to test the influence of demographic factors such as age, sex, marital status and degree programme on students' perception about the efficacy of ODL and support services provided by OUT to its students

3.0 **Results and Discussion**

A total of 144 questionnaires were administered to the students of OUT. The questionnaires were filled and returned at a 100% return rate. The demographic information of the respondents is summarized in Table 1.

Table 1: Demographic Information of Respondents (n=144)

Demographic factor	Frequency	Percentage (%)
Gender		
Male	60	42
Female	84	58
Age (Years)		
19-30	98	68
31-40	40	28
41-50	6	4
Degree Perused		
BEd. Science	14	10
BA. Ed	51	35
BEd. Arts	26	18
BSc. Ed	27	19
PGDE	26	18
Years of Study		
First Years	59	41
Second Year	41	29
Third Year	44	31
Marital Status		
Single	76	53
Married	68	47

The findings in Table 1 indicate that the study involved more females than males, which implies that most of the students who opt for ODL as a means of knowledge acquisition are female. It is then obvious that ODL offers flexibility for females to participate in higher education without being barred by the time constraint due to multiple obligations at home and at work. This is consistent with Moon et al. (2005) who posits that distance and time become manageable when learners opt for ODL mode of knowledge acquisition. Similarly, URT (2014) mentions ODL as a significant and modern educational development that saves costs and time, thus enabling a big number of people to participate in learning. Again, the table indicates that most of the participants (98%) were aged between 19 and 30 years. This is an active and productive age group that is likely to have a significant contribution to the nation. In regard to degree programme, most of the students were taking "Bachelor of Arts with Education'' and the majority of were in their first year of study.

The study also sought to examine learners' perception towards the efficacy of ODL in OUT. The five-point scale was clustered into three and descriptive statistics (including frequencies, mean and standard deviation) were established and presented in Table 2 below.

Table 2: Learners Perception towards efficacy of Open and Distance Learning

	Agree		Not Sure		Disagree		Mean	SD
	N	%	n	%	n	%		
Open and distance learning is highly valued by the learning community	143	99	0	0	1	1	1.01	0.167
Open and distance learning goes with the change of science and technology	137	95	4	3	3	2	1.07	0.327
Open and distance learning is preferred by many scholars by lifelong learners	135	94	6	4	2	1	1.07	0.306
Open and distance learning is a cost effective mode of learning	134	93	7	5	3	2	1.09	0.353

Open and distance learners gain high respect from the learners	133	92	7	5	4	3	1.10	0.387
Open and distance learning is regarded by Tanzanian society as the weakest education system in the country	132	92	5	4	6	4	1.12	0.436
Open and distance learning is considered as education for the in- service and people with low performance in their secondary education	124	87	8	6	11	8	1.21	0.567
Open and distance learning is an effective and efficient mode of learning	121	84	10	7	13	9	1.25	0.609
The learning courses studied at open and distance learning reflect national needs	129	90	5	4	10	7	1.17	0.533
Open and distance learning encourage self-learning to students	132	92	7	5	5	4	1.12	0.418
Learners in open and distance learning are involved in decision making regarding to their learning processes	132	92	4	3	8	6	1.14	0.482
Gender is highly considered in promoting participation in open and distance learning	131	91	4	3	9	6	1.15	0.506
Current and relevant courses in relation to world market are offered in open and distance learning programs	136	94	2	1	6	4	1.10	0.415
Total							1.16	0.50

From the findings above, it can be observed that both the individual and average means for all items (1.16) fall under the 'agree' category. Thus, both of them indicate that the participants from the Open University of Tanzania had a positive perception on the efficacy of ODL in relation to their general life. In the same line, the individual standard deviations (SD) ranged from 0.16 to 0.61 with a mean value of 0.5, which shows little dispersion of the data around the mean value. This implies that the respondents had nearly similar answers to the questions over their perception of the efficacy of ODL.

The findings are consistent with Hung et al. (2010) who studied learners' readiness for online learning by evaluating both scale development and their perception. At the same time, the findings coincide with Rumble (2000) and Daniel (2017) whose studies also found that ODL is cost-effective. However, the findings are inconsistent with Simonson et al., (2019) whose study showed that distance learners feel isolated and stressed due to lack of organizational support, something that eventually leads to non-completion of their course programmes. Likewise, they are against Zikmund et al. (2010) who revealed programme costs, lack of equipment and infrastructure, instructional concerns and poor technical assistance as perils for ODL. Also, they are opposed to Parker (2003) whose findings indicated that financial constraints constitute the most problematic peril facing ODL. Moreover, they are against the findings by Pityana (2004) who is suspicious of the quality of graduates produced through the ODL route. As well, they are in discord with Belanger & Jordan (1999), Biao (2012), and Kalleberg et al. (2006) who showed that school directors have negative perception towards the possibility of distance education meeting the training needs of teachers.

Descriptive statistics results were complemented with inferential statistics in order to bring meaningful interpretation of the data. This relationship between demographic factors and learners' perception on the efficacy of ODL was determined using Pearson's correlation test and the results are as summarized in Table 3 below:

Table 3: Pearson's Correlation Matrix of Learners' Perception on Efficacy of ODL and Demographics

			1	**2**	**3**	**4**	**5**	**6**
1	Sex	Pearson Correlation	1					
		Sig. (2-tailed)						
2	Degree program	Pearson Correlation	0.110	1				
		Sig. (2-tailed)	0.191					
3	Year of Study	Pearson Correlation	0.080	.225**	1			
		Sig. (2-tailed)	0.342	0.007				
4	Age of respondent	Pearson Correlation	0.218**	.328**	0.080	1		
		Sig. (2-tailed)	0.009	0.000	0.341			

5	Marital Status	Pearson Correlation	0.179*	.379**	0.200*	.507**	1	
		Sig. (2-tailed)	0.032	0.000	0.016	0.000		
6	Learners Perception towards efficacy of ODL	Pearson Correlation	0.109	0.100	0.177*	0.120	0.039	1
		Sig. (2-tailed)	0.194	0.235	0.034	0.150	0.646	

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

Results from Pearson's Correlation Matrix above show that the years of study, age of the respondent and marital status have a significant influence on the learners' perception of the efficacy of ODL. Unlike these variables, sex and degree programme have less correlation with learners' perception.The learners' year of study was found to have a significant positive association with the learners' perception. Pearson Correlation values were recorded at r =0.177 and p =0.034. Also, marital status and age were found to have a strong correlation with learners' perception on the efficacy of ODL (P values =0.007, 0.000 and 0.000 respectively).

The findings corroborate Hung et al. (2010) who show that college students' perception on readiness and the efficacy of online learning have a significant association with their grade (year of study). This might be a result of improved self-directed learning among advanced students, who also demonstrate higher competence in using the ODL system compared to the freshers. This is also in line with Edom (2012) who shows that students' gender, age and knowledge can influence the use of e-learning resources in secondary school libraries. Sex was not found in any significant relationship with learners' perception, something that is in line with studies such as (Lindberg et al.,2010; Muhammad,2017; Owan, 2020; Owan et al.,2019) which have also shown that it has an insignificant influence on students' performance. The implication of these findings is that the designing of ODL program has to put into consideration different factors, including age, sex, marital status, degree program and the year of study in order for them to be effective.

On the other hand, the adequacy of andragogical and pedagogical strategies used in facilitating ODL were analyzed. During the analysis, the five-point scale was clustered into three corresponding frequencies, mean and standard deviations as presented in Table 4

Table 4: Prevalence and Practice of Andragogical and Pedagogical Strategies used by OUT (N=144)

Results on the teaching and learning strategies used by OUT indicated that the strategies are effective. This is

	Agree		Not Sure		Disagree		Mean	SD
	N	%	n	%	n	%		
The open university of Tanzania employs varieties of teaching and learning strategies to the learners	121	84	4	3	19	13	1.29	0.688
The facilitation methods used by the open university yield important skills to the learners	114	79	8	6	22	15	1.36	0.735
Regular consultation between students and facilitators is always done at the open university of Tanzania	111	77	7	5	26	18	1.41	0.779
Learner centered approaches are often applied in distance learning institutions	108	75	12	8	24	17	1.42	0.762
The learning strategies designed by open university of Tanzania are more current and up to date	117	81	4	3	23	16	1.35	0.742
Assessment mode applied at the open university of Tanzania is done reasonably	116	81	6	4	22	15	1.35	0.732
The facilitation processes used at the open and distance learning always lead to better understanding of course programs	118	82	6	4	20	14	1.32	0.706
Online learning processes are practiced by open and distance learning	111	78	7	5	25	18	1.40	0.770
Provision of learning materials is done at Open and distance learning institutions in Tanzania	110	76	8	6	26	18	1.42	0.780
The existing facilitation methods for learning adopted in open and distance learning are effective	110	76	9	6	25	17	1.41	0.770
Total							1.37	0.75

reflected by the total mean value of 1.37, which falls in the agree range, and the standard deviation value of less than 1 (0.75), which indicate resemblance between the andragogical and pedagogical strategies in terms of their

effectiveness. Therefore, the strategies agree with the vision and mission of OUT and its strategic plans and the current mission of " using ICT as a strategic tool in facilitating provision of quality open and distance education, research, and public services" (Mnyanyi et al., 2010). The same andragogical and pedagogical strategies have been reported to be used in other contexts too (Mampane,2015). The findings are against Bhalalusesa (2001) and Mbukusa (2009) who report on a shortage of qualified ODL tutors to enhance effective teaching and learning OUT. In the author's view, the argument by Bhalalusesa (2001) and Mbukusa (2009) can no longer hold at the present since there has been a long lapse of time since the years of publication and OUT has made significant improvement in its andragogical and pedagogical practices.

Evidence from individual item scrutiny showed a significant improvement in OUT's pedagogical and andragogical practices. For example, it was revealed that OUT uses up-to-date methods which are learner-centred, allows regular consultation with students, provides wider opportunities for effective online learning, and serves learning materials to students. Regarding this, one of the facilitators was quoted in an interview saying, "*unlike in the past, currently, there is a significant improvement of the pedagogical and andragogical methods used.* (Facilitator 1, June 2022).

Lastly, the study aimed to measure learners' support services in ODL. Eleven (11) items were used for this purpose. The respondents were asked to answer five-rated items, and the rating ranged from 1 to 5 (1 – strongly Agree, 2 – Agree, 3 – Neutral, 4 – Disagree, and 5 – Strongly Disagree). Then, researcher clustered the items and determined the descriptive statistic. Frequencies, mean and standard deviation were established as presented in Table 5 below.

Table 5: Prevalence of learner's support services provided in ODL

	Agree		Not Sure		Disagree		Mean	SD
	N	%	n	%	n	%		
The open university of Tanzania does provide enough learning materials to its learners	88	61	9	6	47	33	1.72	0.929
Internet services, study rooms, stationeries and consultation services are adequately provided by the open university of Tanzania	81	56	13	9	50	35	1.78	0.932
The open university centers are located in few areas mainly at urban areas	81	56	12	8	51	36	1.79	0.938
Guidance and counseling services are provided to open and distance learners	79	55	10	7	55	38	1.83	0.953
Research and consultation services are given to open and distance learners	83	58	8	6	53	37	1.79	0.953
Qualified facilitators are highly available and accessible in open and distance learning	83	58	8	6	53	37	1.79	0.953
Students-facilitators ratio in open and distance learning is fair distributed	80	56	8	5	56	39	1.83	0.961
Open and distance learning offer interactions among students which serve as a tool for learning	78	54	11	8	55	38	1.84	0.951
Library facilities are readily available in open and distance learning	82	57	10	7	52	36	1.79	0.945
Technical and technological support are available for open and distance learners	87	60	6	4	51	35	1.75	0.950
Open and distance learners have self-learning tools such as computers and e-mail	88	61	6	4	50	35	1.74	0.946
Total							1.79	0.95

The findings on the prevalence of leaners' support services in Table 5 above indicate that there is a relatively low existence and provision of these services since the mean values of individual items range from 1.72 to 1.83 with an average mean value of 1.79,which lies in the "not sure" category. Further, there is a low spread of results as the standard deviations were averaged to 0.95. The results are consistent with Musingafi et al. (2015) who showed that support services for learners were under-resourced, hence causing poor facilitation of learning in the ODL system. In an interview on the adequacy of the facilitation methods used, one female facilitator revealed that:

> "*…the concept of support services is very subjective; learners do not get satisfied with what is considered by an institution as support. They continue demanding for more privilege once one is provided. What is assumed an adequate supportive mechanism for one learner is not taken*

as support by another learner. Therefore, no matter how hard OUT tries to support students' learning, they do not get satisfied."(OUT facilitator 3, June 2022).

The findings correlate with previous studies by Daniel (2010), Dzakiria(2005), Krishnan (2012), Sewart (1993), and Tait (2000, 2003) who have established that support services are central in facilitating open and distance learning. Based on this, the spectrum of the concept of support services needs to be communicated to learners in order to define its boundaries and therefore reduce learners' confusion.

For more critical results and interpretation, Pearson's correlation test was again performed to determine the relationship between support services and demographic variables such as age, sex, degree program, marital status and year of study.

Table below 6 indicates the Correlation Matrix of the stated variables.

			1	2	3	4	5	6
1	Sex	Pearson Correlation	1					
		Sig. (2-tailed)						
2	Degree program	Pearson Correlation	0.110	1				
		Sig. (2-tailed)	0.191					
3	Year of Study	Pearson Correlation	0.080	.225**	1			
		Sig. (2-tailed)	0.342	0.007				
4	Age of respondent	Pearson Correlation	.218**	.328**	0.080	1		
		Sig. (2-tailed)	0.009	0.000	0.341			
5	Marital Status	Pearson Correlation	.179*	.379**	.200*	.507**	1	
		Sig. (2-tailed)	0.032	0.000	0.016	0.000		
6	Learners support services in ODL	Pearson Correlation	0.126	0.158	.343**	.190*	.322**	1
		Sig. (2-tailed)	0.132	0.059	0.000	0.023	0.000	

**. Correlation is significant at the 0.01 level (2-tailed).

*. Correlation is significant at the 0.05 level (2-tailed).

From the analysis it was established that the year of study, age of respondent and marital status were found to be significantly related with leaner's' support services in ODL. Pearson's Correlation values for the year of study were recorded to be r = 0.343, p = 0.000, for respondents' age (r = 0.190, p = 0.023) and for marital status r = 0.322, p = 0.000. The year of study, age of the respondent and marital status can be used to explain the level of experience of the participants. They show that the respondents were more experienced with the support services provided in ODL. This implies that some support services are prevalent in the ODL system, for instance library facilities, qualified facilitators, technical support services as well as research and consultation services. This is in disagreement with Hara (2000) who argues that distance learners experience confusion, anxiety and frustration due to lack of prompt or clear feedback from their lecturers. It however agrees with Purnell et al. (1996) whose findings indicated that students appreciate the personal support offered by tutors by telephone and are also impressed by the audio cassettes and video tapes that supplement their study materials. These observations are considered to be true due to the reason that the aforementioned studies were carried out in different contexts presumed to have variations in the provision of support services. On the other hand, previous studies tended to look at support services in general but the current study has delved deeper into demographic issues. In regard to that, the limited exposure and staff training in distance education in many of the Sub-Saharan countries needs to be overhauled in order to make ODL more effective and avoid what Tait (2014) describes as "living in a fool's paradise.

4. Conclusion

This study assessed facilitators and learners' perception on the efficacy of ODL in Tanzania. ODL learning is an alternative path through which so many people in the world get access to higher education. Based on the findings of this study, it is clear that both students and facilitators (mean=1.5) of the Open University of Tanzania positively perceive (mean=1.5) ODL as efficient. The findings have revealed that ODL is technologically

delivered, is cost-effective, provides flexibility for in-service learners and has relevant programs. Further, some variables such as age, year of study, marital status and sex were found to have a significant influence on learning when Pearson's correlation test was carried out to find out the correlation between learners' perceptions and the support services provided by OUT. Also, it was found that OUT employs effective andragogical and pedagogical strategies to make learners achieve the desired outcomes. However, it was found that students perceive ODL support services to be less effective (mean value= 1.79). This was found to be based on variations in learners' perceptions on the adequacy of students support services such as the open education repository (OER), consultation services, guidance and counseling services and technical support. It is recommended that support services should be improved so as to enhance effective learning in OUT. This will significantly enhance participation in ODL.

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Declaration of interest statement
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THE IMPACT OF COVID-19 ON EDUCATION, LIFE ACTIVITIES AND MENTAL HEALTH OF UNIVERSITY STUDENTS

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ABSTRACT
The COVID-19 pandemic has profoundly affected every facet of human life worldwide. Its spread has significantly restricted outdoor human activities. COVID-19 is an infectious disease caused by coronavirus 2, leading to severe acute respiratory syndrome (SARS-CoV-2). The pandemic had a substantial impact on the daily lives of all student communities, including those in universities. Therefore, this study aims to assess the extent of COVID-19's influence on university students, investigating its correlation with their life activities and mental health. For this study, the researchers employed a descriptive survey research method, adopting both purposive and multi-stage sampling techniques to suit the study's objectives and nature. Data collection was carried out using self-made questionnaires, GAD-7, and PHQ-9 scales. The self-made questionnaire, along with the GAD-7 and PHQ-9 scales, were administered to 150 students at Ravenshaw University, Cuttack, Odisha. This sample included 100 students from general courses, 50 from professional courses, and 67 at the undergraduate level, with 83 at the postgraduate level. The collected data underwent analysis using percentage analysis and the coefficient of correlation (r). The results of the study indicate that COVID-19 has had adverse effects on students' education, social lives, and mental health. Moreover, the study reveals a negative correlation between education and depression, daily life activities and mental health, and future plans and the mental health of university students. In contrast, it was observed that there is a moderately positive correlation between university students' social life activities and their mental health.
Keywords: COVID-19, Life Activities, Education, Mental Health

Introduction

In recent times, the entire world has been struck with an unparalleled global predicament in the form of the COVID-19 pandemic. The pandemic had a significant impact on several aspects such as the economy, culture, and environment, leading to inquiries on issues of regional and racial discrimination, the balance of rights, equality of healthcare access, and matters pertaining to public health (Chaturvedi, Vishwakarma, & Singh, 2020). In addition to its direct health consequences, the ongoing pandemic has instigated a series of significant transformations that have profoundly impacted several aspects of human existence. The COVID-19 pandemic had a substantial influence on the experiences of persons from various socio-cultural backgrounds. In response to the detrimental impact of COVID-19 on student education, which has affected 220 million students (Tari, Amonkar, 2021, & Schleicher, 2020), action has been taken in the areas of remote learning, learning loss prevention, and making sure that minority learners are not left behind (Farnell et al., 2021). This article explores the multifaceted repercussions that the COVID-19 epidemic had on university students, encompassing the various interruptions it has inflicted upon their educational endeavours. The COVID-19 pandemic has led to the closure of campuses resulting in significant disruptions to the educational system (Jena, 2020). Furthermore, the COVID-19 pandemic has accelerated the internationalization of higher education, requiring institutions to adapt

and capitalize on the new educational paradigm (Dhoot, 2020). Through a comprehensive analysis of the data and experiences that have emerged during this difficult period, we seek to shed light on the widespread effects of the pandemic on the student population and emphasize the importance of addressing these issues in the ongoing recovery and adaptation to our rapidly changing world.

Literature Review

Studies on the Influence of COVID-19 on Education

The COVID-19 epidemic has had a beneficial impact on the educational landscape in India, leading to notable advancements in several areas. These include more collaborative efforts among students and educators, increased utilization of online platforms for meetings and discussions, higher digital literacy skills, greater engagement with electronic media, expanded global exposure, enhanced time management abilities, and heightened demand for open, online, and remote learning (Dar and Lone, 2021). Duraku (2020) found that a significant proportion of students encounter difficulties in engaging with online learning as a result of inadequate access to essential technological devices. This limitation potentially hampers their active involvement in online educational activities. The study conducted by SÜT and ZNAAR (2021) examines the impact of the COVID-19 pandemic on educational systems and institutions, highlighting the significant challenges faced by students and the necessity for the adoption of novel pedagogical approaches. The COVID-19 pandemic also had a significant adverse impact on the field of education, manifesting in many ways such as disruptions in the learning process, limitations in access to educational resources, employment losses, accumulation of debt, decreased financial support, constraints on research activities, and a decline in students' motivation to study (Onyema et al., 2020). The COVID-19 pandemic has given rise to opportunities for the implementation of digitally enhanced education in higher education institutions. However, it has also introduced certain challenges, including the abrupt transition to online learning, changes in teaching methodologies, passive learning experiences, administrative issues, and limited access to distant internet connectivity (Dhoot, 2020).

Studies on the Impact of COVID-19 on Life Activities

Asper to Chaturvedi, Vishwakarma, and Singh (2021), the COVID-19 pandemic has severe effects on students' mental health since it disturbs their daily routines, social connections, sleep habits, and exercise regimens. Similarly, Moore et al. (2020) discovered that COVID-19 had a deleterious influence on the mobility and play behaviours of Canadian children and teens, resulting in early collateral consequences. COVID-19 has profoundly affected multiple facets of life, particularly physical activity, time management, and mental health, sleep according to Giuntella et al. (2021). The study by López-Valenciano et al. (2021) highlights the global negative impact of the COVID-19 pandemic on university students' physical activity levels.

Studies on the Impact of COVID-19 on Mental Health

The COVID-19 pandemic has raised anxiety, dysthymia, and depression in German and British responders by 25%, according to Knolle, Ronan, and Murray's study, requiring specific therapeutic regimens and interventions. The 2020 study by Xiong et al. highlighted the COVID-19 pandemic's high levels of psychological distress and its unprecedented threat in numerous nations, revealing how it affected mental health. According to Schäfer et al.'s 2020 research, 15% of respondents satisfied the criterion for traumatic distress as a result of COVID-19, while 10% reported a substantial increase in psychopathological symptoms. According to Son et al.'s (2020) study, COVID-19 caused college students more stressed out, and anxious and interrupted their sleep, which made them seek social assistance. According to a study by Appleby et al. (2022), the COVID-19 pandemic has had a negative impact on university students' mental health, harming schoolwork, online learning, money, and employment prospects. By highlighting the impact of COVID-19 on students' psychological welfare, the study by Villani et al. (2021) emphasizes the need to identify vulnerable sub-groups for psychological help.

Rationale Of The Study

The everyday lives, wellbeing, and future prospects of university students have all been greatly affected by the COVID-19 epidemic (Appleby et al., 2022). Shifting all of a sudden from traditional classroom education to online education has become a burden and challenge for university students. University students are generally assigned a lot of tasks, assignments, projects, and research projects that are severely hampered by the COVID-19 pandemic situation. Even though online education existed before the pandemic, it was not widely used and only a few percentage of students preferred it. But, because of this pandemic, every student is compelled to do online classes. Most of the university students are novice in the realm of online education (Villani et al., 2021; Giuntella et al., 2021). As a result, there have been mental health difficulties among university students. There has been little specific research on the impact of COVID-19 on education, mental health, or daily activities among university students (Giuntella et al. 2020; Appleby et al. 2022). The research examines how the COVID-19 epidemic has affected the mental health of university students, concentrating on the correlation between education, daily life, and mental health as well as focusing on aspects that have an influence on students' mental

health in addition to the pandemic.

Operational Definitions Of The Key Terms

Impact: Refers to a powerful effect that something, especially something new has on a situation or person.

Student's lives: refers to four important aspects of students' lives (viz. Education, social life, daily life and plan for the future)**.**

Mental health: This study measures mental health in university students using General Anxiety Disorder (GAD-7) and Patient Health Questionnaires (PHQ-9), focusing on their ability to cope with stress, work productively, and contribute to their community.

Pandemic: A pandemic is an infectious disease that spreads across numerous nations or continents, impacting a large section of the population.

COVID-19: A transmissible disease called Corona Virus Disease (COVID-19) is brought on by the SARScov-2 virus.

Education: Education is a process which promotes learning, knowledge acquisition, skill development, value acquisition, belief formation, habit formation, and personal development through the transmission of cultural legacy from generation to generation.

Objectives Of The Study

The objectives of the study are:

1. To examine the impact of COVID-19 on the education of students, social life, daily life future plans and their mental health.

2. To find the relationship between the student's lives (education, social life, daily life, and future plan) and their mental health**.**

Hypotheses Of The Study

The hypotheses of the study are:

H1: There will be impact of COVID-19 on the education, life activities, and mental health of university students.

H2: There will be negative correlation between life activities and the mental health of the university students.

Population And Sample

The target population of the study was all UG and PG students pursuing education from different universities of Odisha and the accessible population was the students of UG and PG of Ravenshaw University. The sample of the study was all UG and PG students from both professional and conventional education of Ravenshaw University, for the session of 2020-2022. By using multi-stage sampling, the sample for the study was chosen into several phases. In the first phase, the investigators listed the students enrolled in professional and general courses of Ravenshaw University, for the session 2020-2022. Then in the second phase, students were selected from UG and PG based on streams (such as the Arts, Science, and Commerce). The investigator in the third phase selected 5 departments from UG Arts students and 5 departments from UG science students and UG commerce students. From PG level 6 departments from Arts and 4 departments from science students. In the same way as professional courses, 3 departments were selected MCA, B.Ed. and Computer Science. Students from conventional courses were 105 and from professional courses students were 45 out of 150 students respectively. All the departments were selected purposively. Students from each department were not selected proportionately.

Tools Used For Data Collection

The study utilized Generalized Anxiety Disorder-7 and Patients Health Questionnaire-9 to examine the mental health of university students during the COVID-19 pandemic and a self-made questionnaire was used to assess the impact of the pandemic on education, daily activities, and mental health of university students while keeping in view the nature and objective of the study.

Techniques Of Data Analysis

After the collection of data, the scores were analyzed and interpreted through appropriate statistical techniques:

1) Descriptive statistics, Percentage was computed to see the percentage of students affected by the COVID-19 pandemic and also to find out the percentage of students having anxiety and depression problems.
2) Multiple correlations have been calculated to study the relationship among life activities, education, and mental health of university students.
3) Non-parametric statistics as The Chi-square test was used to compare observed and expected data on the impact of COVID-19 on university students' education, life activities, and mental health.

Result And Discussion

Table No.1. Distribution of Respondents Based on Their Educational Level, Course, and Gender

Basic Information	Variable	Total number of Participants (N) 150	Percentage
Educational Level	UG	77	51.33%
	PG	73	48.66%
Course	General	90	60%
	Professional	60	40%
Gender	Male	78	52%
	Female	72	48%

The objective deals with the impact of COVID-19 on students' education, social life, daily life, future plans, and mental health. From the analysis based on percentage, it was found that out of the 150 participants of the study, 51.33% were from UG level and 48.66% were from PG level, in which 60% were from general courses and 40% from professional courses. Out of the 150 sample population, 52% were female whereas 48% were male population.

Table No.2. Impact of COVID-19 on Education

Items	Responses	N (150)	Percentage
1. Online classes by teachers during COVID-19 lockdown	YES	142	94.67%
	NO	8	5.33%
2. Frequency of online classes in a day	3 class	67	44.33%
	5 class	60	40%
	7 class	23	15.33%
	More	0	00
3.Providing study materials by teachers during online classes	YES	63	42%
	NO	87	58%
4. General study hours of students	3 hours	46	30.67%
	4 hours	66	44%
	6 hours	29	19.33%
	More	9	6%
5. Study hour of students during COVID-19 pandemic	3 hours	43	28.66%
	4 hours	41	27.33%
	5 hours	27	18%
	More	26	17.33%
	Not at all	13	8.66%
6. Satisfaction of students with the online classes	YE	70	46.66%
	NO	80	53.33%
7. Online assessment and examination during pandemic	YES	97	64.66%
	NO	53	35.33%
8. Impact of Covid-19 on students study	YES	77	51.33%
	NO	73	48.66%
9. Difficulty in completing assignments and projects during pandemic	YES	71	47.33%
	NO	79	52.67%

From the above table, it is known that out of the 150 respondents, 94% of respondents said that online classes were taken by the teachers during the COVID-19 pandemic whereas only 5.33% of respondents said online classes were not taken. 44.33% of students out of 150 said they had taken 3 classes in a day, 40% of students said they had taken 5 classes in a day, and 15.33% of students said 7 classes were taken in a day. 42% of students said they were provided study materials during online classes and 58% said they were not provided any study materials. 30.67% of students said their general study hour is 3 hours, 44% of students said their general study hour is 4 hours, 19.33% said their general study hour is 6 hours and only 6% of students said their general study hour is more than 7 hours. Spending time on study during the COVID-19 pandemic 28.66% of respondents said 3 hours, 27.33% said 4 hours, 18% said 5 hours, 17.33% said more than 5 hours and only 8.66% of students responded they were not studying at all. Out of 150 respondents, 46.66% responded that they were satisfied with the online classes whereas 53.33% responded they were not satisfied with the online classes. 64.66% of students responded that they had taken online assessments during the pandemic whereas 35.33% responded they had not taken online assessments during the pandemic situation. 51.33% out of 150 respondents said their study was hampered during covid-19 pandemic whereas 48.66% did not. 47.33% of students responded that it was difficult to complete assignments and projects during the pandemic whereas 52.67% said there was no difficulty in completion.

Table No.3. Impact of COVID-19 on Students' Daily Life Activities

Items	Response	N (150)	Percentage
1.COVID-19 change life activities such as communication, moving out, sleeping duration	YES	96	64%
	NO	54	36%
2. Difference sleeping time before and after the COVID-19 pandemic	YES	100	66.66%
	NO	50	33.33%
3. General sleeping duration in a day	5Hrs	15	10%
	6 hrs	38	25.33%
	7hrs	43	28.66%
	8hrs	37	24.66%
	More	17	11.33%
4. Pandemic restricted outdoor activities	YES	12	74.66%
	NO	38	25.33%
5. Health issues of the students	YES	79	52.66%
	NO	71	47.33%
6. Negative impact of COVID-19 on daily life activities	Strongly agree	76	50.66%
	Agree	64	42.66%
	Neutral	10	6.66%
	Disagree	0	00
	Strongly disagree	0	00
7.COVID-19 created mental tension and anxiety	Strongly agree	70	46.66%
	Agree	64	42.66%
	Neutral	16	10.66%
	Disagree	0	00
	Strongly Disagree	0	00
8. Negative change in family income and expenditure owing to COVID-19 pandemic	Extremely	24	16%
	Very	36	24%
	Moderately	34	22.66%
	Slightly	32	21.33%
	Not at all	24	16%

In the current study, it was found that, out of the 150 respondents, 64% said that COVID-19 restricted their daily activities, such as moving out, having entertainment, and sleeping hours, while 36% stated it did not. Moreover, it was revealed that 66.66% of students stated there was a difference between the duration of sleep they had before and during the pandemic, contrasted with 33.33% said there was no difference. Out of 150 respondents, 10% responded their typical sleeping time is five hours, 25.33% responded six, 28.66% responded seven, 24.66% responded eight, and only 11.33% responded they sleep more than eight hours in a day. It was found that 74.66% of pupils said the COVID-19 pandemic had limited their outdoor activities, while 47.33% disagreed. It was also discovered from the study that 52.66% of respondents indicated having health problems, compared to

47.33% who didn't have any health issues. This study highlights the detrimental impact of the COVID-19 pandemic on daily life. 42.66% of respondents said they agreed, 50.66% said they strongly agreed, and 6.66% were unsure. In this study, 46.66% of participants strongly agreed and 42.66% agreed that COVID-19 causes the development of mental stress and anxiety, while only 10.66% of participants were neutral. The study also indicated that 24% of respondents agreed very strongly, 22.66% strongly, and 21.33% slightly that the pandemic negatively impacted family income and spending, with only 16% of respondents disagreeing.

Table No.4. Impact of COVID-19 on Students' Social Life Activities

Items	Responses	N(150)	Percentage
1. COVID-19 pandemic restricted communication with people, friends and neighbors.	Strongly Agree	60	40%
	Agree	64	42.67%
	Neutral	20	13.33%
	Disagree	6	4%
	Strongly Disagree	0	00
2. Communication with family members also gets restricted because of the pandemic	Strongly Agree	36	24%
	Agree	43	28.67%
	Neutral	42	28%
	Disagree	29	19.33%
	Strongly Disagree	0	00
3. Spending time on social media as Facebook, Whatsapp, and Instagram	Extremely	65	43.33%
	Very	65	43.33%
	Moderately	20	13.33%
	Slightly	0	00
	Not at all	0	00

The study revealed that 42.67% of 150 students strongly agreed and 40% agreed that COVID-19 fears have limited their communication with friends, people, and neighbours as 4% disagreed and 13.33% remained neutral with the same. The study also revealed that 24% of students strongly agreed and 28.67% agreed that COVID-19 fears have impacted family communication, while 19.33% disagreed and 28% remained silent. This study's findings discovered that, out of 150 students, 42.67% strongly agreed, 40% agreed, 13.33% remained neutral, and 4% disagreed with the statement that COVID-19's communication restrictions with friends, people, and neighbours. The study revealed that students spend 43.33% of their time on social media regularly, 43.33% spend a lot of time there, and 13.33% spend little time on it.

Table No.5. Impact of COVID-19 on the Future Plans of Students

Items	Response	N (150)	Percentage
1. Future plan of students after study	Job	79	52.67%
	Further study	71	47.33%
2. Impact of COVID-19 on future plan	Extremely	54	36%
	Very	49	32.67%
	Moderately	39	26%
	Slightly	8	5.33%
	Not at all	0	00

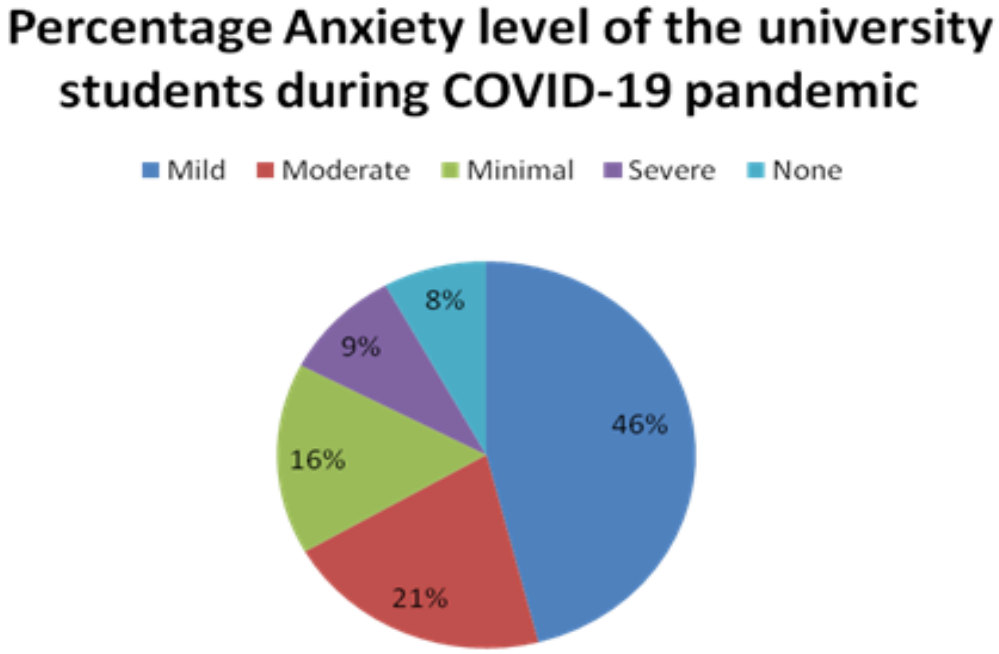
Out of 150 students, the study found that 52.67% intended to continue their education after completing their current course study, and 47.33% intended and planned to begin looking for a job and career. The study revealed that 36% of students felt COVID-19 had an extremely negative impact on their future plans, while 32.67% considered it very negative, 26% considered it somewhat negative, and 5.33% considered it very less negative.

Table No.6. Impact of COVID-19 on the Mental Health of University Students.

Educational level	**UG**	**73**	**48.67%**
	PG	**79**	**51.33%**
Course	**General**	**79**	**52.67%**
	Professional	**71**	**47.33%**
Gender	**Male**	**64**	**42.67%**
	Female	**86**	**57.33%**

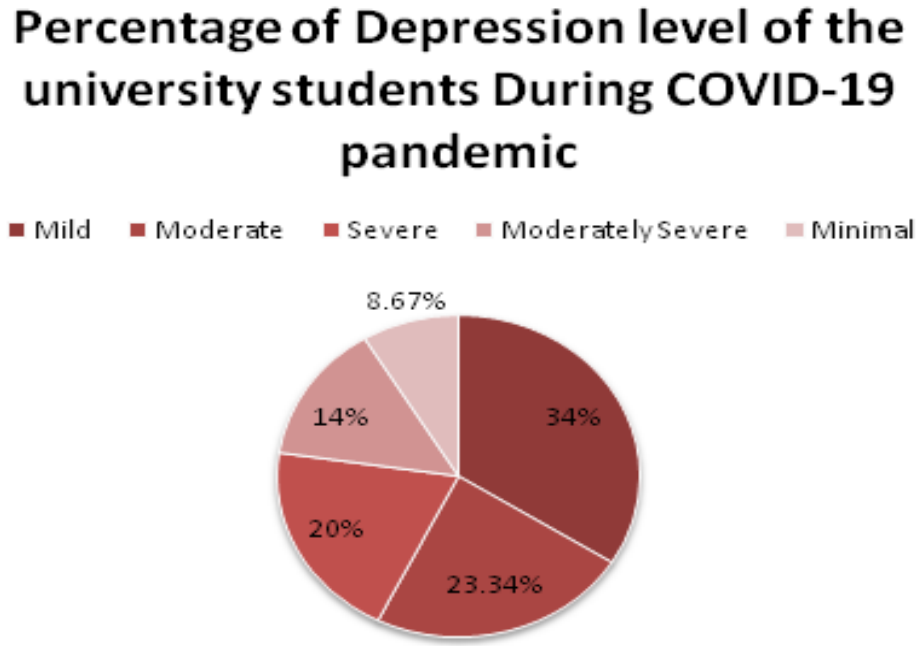
Based on the study, out of the 150 students who responded on their mental health, 48.67% were Undergraduate level students and 51.33% were Postgraduate level students. On the basis of course, 52.67% of respondents from conventional courses and 47.33% from professional courses responded. 42.67% of responders were male and 57.33% were female based on Gender.

Figure No. 1. Percentage Anxiety Level of University Students During the Pandemic Based on the Generalized Anxiety Disorder Scale-7



The study found that among the 150 people who completed the GAD-7 scale to assess their degree of anxiety during the COVID-19 epidemic, 8% of students reported having no anxiety issue, 16% reported having a "Minimal level" of anxiety disorder, 46% reported having a "Mild level" of anxiety issue, 20.67% reported having a "Moderate level" of anxiety issue, and 9.33% reported having a "Severe level" of Anxiety issue.

Figure No. 2. Percentage of Depression Level of University Students during the COVID-19 Pandemic Based on the Patients Health Questionnaire scale-9 (PHQ-9)



Out of 150 students who responded to the PHQ-9 Scale score, the study found that 8.67% of students had "Minimal level" depression, compared to 34% who had "Mild level," 23.34% who had "Moderate level," 14% who had "Moderately severe level," and only 20% who had "Severe level" depression.

From the study and interpretation presented above, it can be concluded that around 94% of Undergraduate and Post-graduate level students stated pandemic had an adverse impact on classes and education as only 6% of students opposed it. The study found that Covid-19 negatively affected college students' education and made it more difficult for them to complete projects and assignments. These study findings were also supported by research studies by Kunal Chaturbedi, Dinesh Kumar, Vishwakarma, and Nidhi Singh (2020), which revealed that COVID-19 had an adverse impact on university students' mental health and their education. The social life and daily life activities of university students were adversely affected by the COVID-19 pandemic. The COVID-19 pandemic has significantly impacted the mental health of university students. With respect to the Anxiety level of university students got adversely affected, about 16% of students were found to have a minimal level of anxiety issue during lockdown, 46% Mild, 20.67% moderate, and 9.33% severe level of anxiety of university students during lockdown. With respect to the depression level of the students during the COVID-19 pandemic, it is found to have 8.67% minimal,34% mild, 23.34% moderate, 14% moderately severe and 20% found to have severe depression level during Covid-19 pandemic situation.

A. Correlations between University Students' Education, Life Activities, and Mental Health.

Table No.1. Correlation between Education and Anxiety

Variables	N	Coefficient of correlation(r)	Level of significance at 0.05 level (2-tailed)
Education Vs. Anxiety	**150**	**0.006**	**.174**

Table 1 shows that the obtained value of the coefficient of correlation (0.006) of Education and Anxiety of the university students shows a moderately positive correlation. It means that education is moderately positively related to the anxiety of the students. Hence, Hypothesis no.2 which earlier stated that "There will be negative correlation between life activities and mental of the university students" is rejected.

Table No. 2. Correlation between Education and Depression

Variables	N	Coefficient of correlation(r)	Level of significance at 0.05 level (two-tailed test)
Education Vs. depression	**150**	**-0.058**	**.174**

It is clear from Table No. 2 that there is a negative association between university students' education and depression, with the obtained coefficient of correlation (-0.058). It means that depression and education are negatively correlated. Hence, Hypothesis no.2 which earlier stated that "There will be negative correlation between life activities and mental of the university students" is retained.

Table No.3. Correlation between Daily Life and Anxiety

Variables	N	Coefficient of correlation (r)	Level of significance at 0.05 level (2 tailed test)
Daily life Vs. Anxiety	**150**	**-0.020**	**.174**

Table no.3 indicates a negative correlation between daily life activities and anxiety among university students, with a value of -0.020. It means that daily life activities and anxiety are negatively related to depression and daily life activities. Hence, Hypothesis no.2 which earlier stated that "There will be negative correlation between life activities and mental of the university students" is retained

Table No.4. Correlation between Daily Life and Depression

Variables	N	Coefficient of correlation(r)	Level of significance at 0.05 level (2-tailed test)
Daily life Vs. Depression	**150**	**-0.041**	**.174**

Table no.4 reveals a negative correlation (-0.041) between daily life activities and depression among university students. It means that the daily life activities and depression of university students are negatively correlated.

Hence, Hypothesis no.2 which earlier stated that "There will be negative correlation between life activities and mental of the university students" is retained.

Table No.5. Correlation between Social Life and Anxiety

Variables	N	Coefficient of correlation (r)	Level of significance at 0.05 level (2-tailed test)
Social life Vs. Anxiety	**150**	**0.003**	**.174**

Table no.4 reveals a positive correlation between university students' social life activities and anxiety, indicating a strong positive correlation (0.003) between these factors. Hence, Hypothesis no.2 which earlier stated that "There will be negative correlation between life activities and mental of the university students" is rejected.

Table No.6. Correlation between Social Life and Depression

Variables	N	Coefficient of correlation (r)	Level of significance at 0.05 level (2 tailed test)
Social life Vs. Depression	**150**	**0.020**	**.174**

Table no.6 reveals a positive correlation (0.020) between social life activities and depression among university students. This means that the social life activities and depression of university students are positively correlated. Hence, Hypothesis no.2 which earlier stated that "There will be negative correlation between life activities and mental of the university students" is rejected.

Table No.7. Correlation between Future Plan and Anxiety

Variables	N	Coefficient of correlation (r)	Level of significance at 0.05 level (2 tailed-test)
Future plan Vs. Anxiety	**150**	**-0.038**	**.174**

Table no.7 reveals a negative correlation between future plans and anxiety among university students, with a value of -0.038. It means that the future plan and Anxiety are negatively correlated. Hence, Hypothesis no.2 which earlier stated that "There will be negative correlation between life activities and mental of the university students" is retained

Table No.8: Correlation between Future Plan and Depression

Variables	N	Coefficient of correlation (r)	Level of significance at 0.05 level (2 tailed test)
Future plan Vs. Depression	**150**	**-0.005**	**.174**

Table no.14 reveals a negative correlation (-0.005) between future plans and depression among university students. It means that the future plan and depression are negatively correlated. Hence, Hypothesis no.2 which earlier stated that "There will be negative correlation between life activities and mental of the university students" is retained.

Based on the analysis and interpretation presented above, the study finds a modestly favourable link between education and anxiety-related mental health among university students during the COVID-19 pandemic. Daily activities have a detrimental effect on mental health, influencing both anxiety and depression. On the other hand, social activities exhibit a favourable correlation with mental health. In conclusion, it can be stated that there is a generally good association between education and mental health connected to anxiety, but a negative relationship between education and mental health related to depression. Due to a negative association between everyday activities and both depression and anxiety, university students' mental health during the pandemic has been negatively impacted. The association between university students' social life activities and mental health, which includes both depression and anxiety, supports the positive impact of social activities on their mental wellbeing. Notably, there is a negative correlation between students' future goals and their mental health, including depression and anxiety, showing that mental health problems have a big influence on their strategies and plans for the future.

Conclusion

The objective of the current study was to evaluate how COVID-19 affected the everyday lives, academic performance, and mental health of university students. Findings showed that the pandemic had negative consequences on schooling, with students dissatisfied with online courses. Additionally, students reported

interruptions in their study time, limitations on everyday activities including entertainment and sleep schedules, hampered social life, and a financial burden on their families. Additionally, COVID-19 had a detrimental impact on their future ambitions. By comparing the results of the GAD-7 and PGQ-9 scales, it was found that 8.67% of participants had light to moderate depression, 34% showed mild to moderate depression, 23.34% had moderate to severe depression, 14% showed moderate to severe depression, and 20% reported severe depression. During the pandemic, a disturbing 92% of pupils displayed some sort of mental health condition. The study found a weak negative link between education and anxiety but a moderately positive correlation between education and depression, suggesting that educational activities have a big influence on mental health. Additionally, routines like eating habits and staying up late had a detrimental impact on mental health, emphasizing their importance. Social interactions have been positively correlated with mental health, highlighting their significance. Furthermore, a negative relationship between future plans and mental health revealed that anxiety and despair among university students were caused by disturbed plans.

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TRANSFORMATION IN ONLINE EDUCATION IN INDIA IN CONTEXT OF SARS-COV-2 (COVID19) AND NPE-2020

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ABSTRACT
World has witnessed a complete lockdown in educational institutions during covid-19 pandemics. There was a severe learning crisis in many countries including India. Existing e-learning formats could not meet the increased demands of the learners community. Students' learning outcomes, interaction, satisfaction and engagement level was acutely affected and thereby demanded innovations and extensions in existing online learning tools. Same year, India witnessed new education policy 2020 envisioning equity and quality based higher education to produce creative and global individuals. Policy set global hallmarks to achieve in the field of education, research and innovation. It proposes integration of latest technology with advanced pedagogies for students' better learning outcomes and experiences. On one hand, policy promised utilization of digital technology in all phases of teaching, learning and assessment, and on other hand, covid-19 challenged traditional mode of learning and stirred the phenomena of technological advancements in online education. The paper discusses the pressing need of advancements in existing online education format to solve challenges posed by pandemics and the dream set forward by policy, 2020. Paper also throws light on various digital initiatives taken up by Indian govt. in line with education policy and to foresee challenges in the field of online education as casted by pandemics.
Keywords: NPE-2020, online education, covid-19, pandemics, educational technology, higher education, moocs.

Introduction

Universal quality education is one of the chief concerns of the new education policy (NPE-2020). India has a rich pool of human talents, and resources that have not yet been utilized for national good in the lack of equity based qualitative and relevant education. Diversity, in terms of geographical dividend, languages, religions, beliefs, and culture, is one of paramount characteristics of India. Therefore, policy stresses the high need of quality education to develop and maximize the talent and creativity of young learners for individual betterment, social coherence, national unity and international understanding. UNESCO has also, in its agenda of Sustainable Development (2030), strived to achieve the goal of "ensure inclusive and equitable quality education and promote lifelong learning opportunities for all" (p. 3). With the invention of internet technologies in the beginning of the 21st century, almost all walks of life have undergone drastic change, education is no exception. Satishkumar et al. (2020) concluded in their studies that break of pandemics (COVID-19) has accentuated the need of online learning in almost all phases of education and educational institutions worldwide. Traditional set-up of teaching-learning was challenged to meet the educational needs of learners in the lockdown period. Institutions quickly resorted to e-learning for continuing education of their students. E-learning is regarded as a new form of online education based on ICT i.e. information and communication technology (Moore et al., 2011). Teachers, educators, and other stakeholders are eager to know how e-learning can enhance learning outcomes. The need for adaptation and updation in traditional education was realized with the onset of the rapid advancements in technology. Learners of today need to learn at any time, and any place as per their convenience (Wolfinger, 2016). Online education proved to be a panacea for the education community during the lockdown period when face-to-face education was impracticable. It is crystal clear as to how covid-19 situation catalyzed the pace of online education to carry on with teaching learning. Policy envisioned leveraging educational technology for escalating access, equity and quality in higher education specifically. Developing nations, like India, faced a severe learning crisis in the pandemics time owing to their inability to fastly adopt technology in education. Paper discusses a pressing question resulting from convergence of new education policy, covid-19 pandemics, and evolving online education. It reviews online education as a new era in Indian education promising to work out the challenges posed by pandemics and vision set by NPE-2020.

Objectives

The paper seeks to:

1. To review policy's vision for Online Education.
2. To study the impact of pandemics on online education.
3. To study various digital initiatives taken up by the government of India.
4. to study and discuss the potential of Online Education.

Research Methodology

Methodology of this research paper is descriptive in nature and sprit. It is based upon the review of various related studies, new educational policy, and various government documents. Personal experiences of researchers as educators have been a great source of enlightenment for the present paper.

Outbreak of Covid-19: Paving Way for Quality Online Education

Covid-19 pandemics in 2020 caused an unprecedented situation throughout the world forcing the education systems to switch to online learning and teaching. Closure of educational institutions and suspension of classroom learning teaching created a gap in students' learning. Technological advancements and internet technologies have changed the lives of people immensely, especially in education (Nadikattu, 2020). Many countries over the globe temporarily closed educational institutions to prevent the spread of the COVID-19 virus. As per UNESCO (2020) data report, around 191 nations have imposed national or local school lockdowns, resulting in a huge number of students (over 91%) enrolled in schools not being able to go to school as of April 20, 2020 (Lamrabat, 2020). UNESCO has supported such countries in efforts to counterbalance the instant effect of schools closures, especially for comparably more vulnerable and disadvantaged societies, and to ensure the continuity of education for all through distant and online learning (UNESCO, 2020). The continuous shutting down of around 1.5 million schools nationwide due to the covid-19 has affected nearly 247 million students enrolled in elementary and secondary schools in India (UNICEF, 2021). Digital divide across Indian vast land is the main factor for disruption in teaching learning during pandemics. Many evidence and research reports indicated the impact of COVID-19 as most severe among the learners from vulnerable groups (women, SC, STs, children, aged, poors, minorities, etc.) as they cannot afford technology due to their poor economic condition. Continued lockdowns caused severe learning crises and gaps among learners belonging to vulnerable sections of society. Resorting to online mode of educational delivery was the only alternative to save learners from such a learning crisis. Though students engaged in sudden online learning for longer times suffered from physiological problems and psychological stress, suggest some studies, we cannot deny the potential of online education to provide qualitative education to learners (Goswami et al., 2021). The Indian government too adopted online education for compensating learning loss by providing e-content, virtual interaction (though limited) and learning tools; all these techniques have limitations too. We can conclude that there is a dire need of developing online education platforms, learning tools, applications and software, quality digital content, quality interaction and assessment forums, etc. to solve the threats posed by pandemics and similar situations that might be caused in near future. Let us discuss more inputs necessary for evolving qualitative online education as suggested by NPE-2020.

National Education Policy 2020: Much Anticipated Silver lining

The Year 2020 also had a positive breakthrough with the intervention of National Policy on Education 2020. It re-imagined the educational landscape in India through equity, inclusion and quality in education. The Year 2020 started with unprecedented tests on the education system of the country and the policy seemed as a silver lining (Acharya, 2020). It also pointed out some of the issues and concerns of Higher Education which need to be addressed in the Post-2020 period. These issues include: "a severely fragmented higher educational ecosystem; less emphasis on the development of cognitive skills and learning outcomes; limited access particularly in socio-economically disadvantaged areas; with few HEIs that teach in local languages; limited teacher and institutional autonomy; lesser emphasis on research at most universities and colleges; lack of competitive peer reviewed research funding across disciplines; suboptimal governance and leadership of HEIs; and an ineffective regulatory system, and large affiliating universities resulting in low standards of undergraduate education". These issues have been significant barriers in achieving the parameters of quality in higher education. NPE-2020 envisions its learners to cross these barriers and inculcate in themselves 21st century skills. The policy aims for equitable and inclusive education with emphasis on education for socially and economically disadvantaged groups which includes different identities; socio-cultural, geographical and disabled groups. It envisions increased access, equity, and inclusion in higher education through a range of measures. Being based on the foundation of accessibility, equity, quality, affordability and accountability, the policy aims at changing the country into a vibrant hub of knowledge (Acharya, 2020). Extensive use of technology and online and digital education has been suggested to overcome the barriers and challenges. In order to enhance use of technology in education an autonomous body National Educational Technology Forum will be made to create a platform for exchanging the

ideas on use of technology freely. More emphasis will be given on better adaptation and integration of technology based platforms like SWAYAM and Diksha. Technology should be used extensively in the teaching learning process, and online and digital education must address concerns of equity. Removal of linguistic barriers and enhancing access for divyang students should be of prime concern (Panditrao & Panditrao, 2020). India has the highest number of youths in the world who will decide the fate and future of the country if they are provided with quality and equity based educational opportunities. Core focus of the new education policy is thoughtful amalgamation of innovative technology and new pedagogy for enhanced learning experiences and to pave the way for quality education.

Policy-2020 Envisaging Digitalisation of Education

NEP-2020 emphasizes experienced-based, child-centered pedagogy for quality learning. Learning should be interactive, useful, engaging and interesting as learners are active constructors of their own learning. ICT-based education will optimize learning outcomes and experiences. Policy looks forward to judiciously mixing technology with content for engrossing learners in creative tasks. Among such technological innovations are MOOCs, a recent techno-pedagogical invention in online education. Policy suggests plans for developing more digital platforms and revamping the existing online platforms (NEP, 2020). Online education (MOOCs, etc.) is a means by which the teaching-learning process is carried out by providing open access to unlimited participants over the internet. It has removed the barriers of distance and time by facilitating a large number of learners around the world to access course material at any time of the day (Kurien & Chandramana, 2020). Pervasiveness of technology has affected the way the learners learn (Prensky, 2005) and also the way the teachers teach (Becker, 2000, Ingram, Willcutt & Jordan, 2008). MOOCs are the recent intervention in ICT based pedagogy and online learning (Trehan, Sanzgiri & Li, Wang & Joshi, 2017). MOOCs are massive in nature and cater to diversity in several aspects like; cultural, socioeconomic, demographic, etc. India is in a stage of massification of higher education. The developing and underdeveloped nations which have very limited resources can now embark upon massification of educational programs with quality online education. In addition to an increase in enrollment in higher education, NPE-2020 aims to enhance access opportunities by catering to specific segments of the society (NIEPA, 2020). Large number of learners irrespective of their geographical location can access and participate in MOOCs (Bozkurt, Ozbek & Ritcher, 2017). One of the aims of NEP is to utilize technology in education and considers e-learning as the need of the hour. Policy also mentions creating the National Educational Technology Forum (NETF) which can be used as a platform for exchanging ideas related to technology (Kaurav, Rajput, & Baber, 2019). NPE-2020 envisions that GER, equity based access and quality of higher education can be ensured with Online courses. Since the introduction of MOOCs in education all over the world, India has also taken the lead role in enrollment in MOOCs and also as a MOOC provider. The first initiative in this direction was taken by IIT Bombay in July 2004 by offering three open courses with an enrollment of around 35000. Birla Institute of Technology and science in collaboration with Harvard and MIT developed MOOCs with edX in 2014. India continued to develop MOOCs for different levels of education and worked for its indigenously developed MOOCs delivering platform SWAYAM. It was launched by the Ministry of Education in July 2016 with an aim of achieving three cardinal principles of higher education; access, equity and quality in higher education. Development of such digital platforms has the potential of eradicating the barriers of equity-based quality education and many other demerits of traditional education systems. Revamping and transformation in higher education is possible with carefully designed ,developed and validated MOOCs.

Various Digital Initiatives Taken by GoI: An Era of Online Education

The Government of India working in conjunction with the Ministry of Education has visioned transforming India into a global knowledge super power. It has laid its prime focus on development of educational technologies to be effectively utilized in teaching and learning across Indian classrooms. GoI has taken up several initiatives to boost up the genda of qualitative education with technological interventions.

1. **National Mission in Education through ICT:** Government of India has committed to accelerate GER of higher education by ensuring access, equity and quality of higher education for masses who have remained untouched by mainstream education. National mission in education with ICT seeks to provide high quality digital content, connectivity to institutions, and thereby lowering the digital divide.
2. **SWAYAM (Study Web of Active Learning for Young Aspiring Minds)**: It is an indigenously developed digital platform designed by Government of India to achieve three cardinal principles of education i.e. access, equity and quality. SWAYAM hosts e-learning content for class starting from 9th to post-graduation. Content is designed by the best faculty of India in an interactive and interesting format. Content is available all time, everywhere and for free.
3. **NPTEL (National Program on Technology Enhanced Learning)**: NPTEL was designed collectively by IITs and IISc in 2003, funded and supervised by the Government of India. It is the world's largest repository of videos for engineering, basic sciences, and some humanities and management courses. Its

main aim is to facilitate qualitative engineering education to all corners of India at affordable cost or free. NPTEL promotes the idea of quality online education.

4. **Swayam-Prabha:** Swayam Prabha, another important initiative, contains a group of 34 DTH TV channels dedicated to broadcasting quality-based educational programmes for a variety of courses on 24by7 basis with the help of GSAT-15. Content is repeated all the day so that learners can watch their desired program as per their convenience.
5. **MOOCs (Massive Open Online Courses)**: MOOCs are asynchronous teaching learning platforms which contain educational content in a variety of formats as pre-recorded lectures, related resource videos, lecture notes and pdf, assignments and tasks, discussion forum, self assessment tools. MOOCs gained popularity during pandemics as learners found it easy, convenient and economic to access moocs as per their choices.
6. **National Academic Depository (NAD):** NAD is a 24 hours online store house of academic documents i.e. certificates, degrees, diploma, marksheets, etc. duly digitized and signed by concerned institutions. NAD not only makes access and retrieval of documents easy but also it validates its authenticity and safety. Anyone from anywhere can access and download their academic documents as per needs.
7. **National Digital Library (NDL):** NDL is a single window platform where one can access educational resources (books, articles, audios, videos, etc.) lying anywhere in India.
8. **Some Other Initiatives:** Apart from these major initiatives taken up by GOI to bring quality in education by integrating technology with education, some other important ones include e-Shodh Sindhu, e-Yantra, e-Kalpa, Vidwan, Shodhganga, Spoken tutorial, GIAN (Global Initiative for Academic networks), IMPRINT, Digilocker, e-PG Pathshala, etc. All the digital initiatives have worked toward bringing excellence and quality in education.

It can be accepted that there have been a flood of digital initiatives taken by the ministry of education and govt. of India in the field of online education. New pedagogies and technologies coupled with these initiatives have brought significant impact on teaching and learning practices, especially post-covid19 scenarios. Various studies have also revealed some sort of deficiencies in digital platforms like swayam, swayam prabha, etc. in terms of poor pedagogical concerns, low content quality, lack of interactivity, poor assessment and discussion forum, and others. It is equally true that exposure to lockdown situations has forced existing online education formats to work out their deficiencies and to meet the increased educational demands. There is a combined impact of education policy thrust, pandemics demands, and inertia of traditional education that brought forward a slogan of quality online education (MOOCs, Hybrid learning, Blended learning, etc.). The potential of online education to realize policy vision can not be under-estimated in the near future. It is pertinent to discuss the reality of existing online education scenarios, especially MOOCs, and to establish its true essence in Indian Higher Education.

Skepticism for Online Education as a Renaissance in Indian Higher Education: Myth or Reality?

Education system must work for enhanced human interaction and their well being. Education technology should be used in a way to promote learning across distance, communication and collaboration. And this shift to online remote learning will eradicate inequalities (UNESCO, 2020). Digital devices have helped in liberation of learning from fixed geographical locations to anywhere in the world. With the help of sophisticated e- learning technologies and pedagogic approaches Online Education has the potential to provide equality as their reach is for global participants (Jordan, 2014). On the review of the experiences of open learners, MOOCs attract diverse learners on the basis of geography, culture and academic backgrounds (Levy, 2011; Kop, 2011; Rodriguez, 2012). And in the context of the pandemic Covid-19 crisis, the interest and enthusiasm in digital learning technology has increased exponentially (UNESCO, 2020). Traditional classroom learning experiences have been found inadequate to meet growing learning requirements of 21st century learners. It is high time to plan well and sincerely execute such a mechanism which can overcome the barriers of access, equity and quality which are haunting the visions of higher education in India (NEP, 2020). Chea (2016) developed an insight into the fast changing trends in the field of education through his writings for an article on "Benefits and challenges of massive open online courses." He regarded MOOCs as the most novel, recent and innovative with respect to education. Paper explained about the massiveness of Online Education in terms of its applicability to a huge number of learners without any barrier of time and place but dropout rate is a challenging issue on one hand whereas overall cost of designing and developing Online Education is also very high. Rolfre (2014) in his study stated that traditional education is mainly overcrowded with outdated teaching methods and pedagogies which failed to meet the diverse needs of 21st century learners. The same teaching methods and pedagogies are scaled up in Online Education which result in low outcome and high dropout rate in MOOCs. AICTE also considered language as a barrier in equity-based access to Online Education for learners from rural areas (Pant, Lohani & Pande, 2021). Teachers also faced barriers during online teaching and assessments; lack of facilities, interruption of family during teaching, lack of institutional support for purchase of tools, lack of training, lack of technical support and lack of clarity and direction during Covid-19 times (Joshi, Vinay, Bhaskar, 2020). The studies on

assessment in MOOCs reveals that MOOCs lack assessment on Psychomotor and affective levels of domains (Sandeen, 2013). Adhikari and Semalty (2021) studied SWAYAM platform and stated that many courses on SWAYAM lacked utilitarian aspect for learners and suggested more need based online education and advocated the need of training for online education developers for delivering the content on digital platform with pedagogical expertise. Murthy et al. (2018) discussed that more efforts should be put in designing, delivering and transacting the digital content for enhancing effectiveness and engagement in online education. It will help in increasing the success rate of online education in India. Long time back the Kothari Commission (1964-66) and even now NEP (2020) also recommended 6% of GDP for education. Different infrastructural limitations, issues of connectivity and technological support system can be overcomed by going with and fulfilling this long wish of policy planners (p.186). Technological barriers, digital literacy and language also pose challenges in participation in online education (Pouezevara & Horn, 2016). In developing countries like India, e- learning technology gives an opportunity to provide education to middle and low income sections of society (Aggarwal, Sharma, Kumar.et al. 2021). NEP 2020 recommended that E- Courses or Online courses should be made available in regional languages specifically in eight major Indian languages (Kurien & Chandramana, 2020). The Indian Government is to play a leading role in strengthening the backbone of e- learning by deploying adequate infrastructure at remote places where people lack access to the internet and devices (Tari & Amonkar, 2021). Recent years have endorsed the hike in enrollment in MOOCs by Indian students all over the world and India is the leading country in terms of enrollment in courses by most popular MOOCs providers like coursera, udacity, edX (Jyoti Chauhan, 2017). As per the research by Harvard and MITx in 2014, 10.5 million of Coursera students were from Indian origin and it made Indian students the second largest community of online learners. Powell and Yuan (2013) stated that online education is open in terms of curriculum, learning pace and assessment process. Online education has the potential to address the challenge of accessibility by being accessible to everyone irrespective of the differences in learners in terms of culture, language, gender and religion. Online education also supports the idea of lifelong learning as it equalizes the learning opportunities for the learners of all age levels (Bordoloi, Das & Das, 2020). Online education is proving to be bliss to those learners who have not been a part of the mainstream education system. This also bridges the gap which prevented many learners from accessing the educational system (Nayak, 2019). For smooth and effective online education in India, low cost internet facilities may be provided to people. Teachers need to be adequately trained to become effective online educators. A good offline teacher may not be an effective online teacher. In the era of industrial revolution 4.0 and for a professional teacher TPACK competency is required (Agustini, Santyasa & Ratminingsih, 2019). Content centric approach should be used in professional training of teachers. It advocates for teaching teachers how to teach the content by using adequate tools and technology (Harris 2005, 2008; Mishra & Koehler, 2007,2009). Online education must include experiential and activity based learning to include affective and psychomotor domain of learning (Panditrao & Panditrao, 2020). Moreover, by providing acquaintance and training in online teaching and learning both to the teachers and learners will make India higher education a world class higher education (Kantipudi, Moses, Aluvalu, Rajanikanth, Golyalla, Goud, 2021). For the disadvantaged group of people who have limited digital access, the use of mass media including tv, community radio, etc. can be extensively utilized for their better education and learning (Panditrao & Panditrao, 2020).

Conclusion:

MOOCs (as one facet of online education) have emerged as an innovative mode of teaching not only in India but all over the world. On the basis of review trends and statistics on MOOCs, the tremendous hike in enrollment in MOOCs was seen in year 2020 with five times enrollment in coursera courses and double the enrollment in edX courses if compared with 2019 enrollment (Shah, 2019). India is the 2nd biggest market for MOOCs in the world following the US. India's population is second to China's and India is 3rd in terms of university enrolment worldwide after the US and China respectively. The demand for higher education is increasing day by day which alone cannot be met by traditional structure of education. Only quality based online education is a ray of hope for those who could not join regular mode of study because of high fees, inflexibilities, and many other reasons. During the pandemic period, India has witnessed a large number of ICT based initiatives on national, regional , state and individual levels and many such initiatives are there which contributed in making education accessible to learners in remote areas (Sharma, 2021). One of such initiatives is SWAYAM and the number of learners registered on it has also increased significantly in the last 2 years as a requirement to learn online in the period of covid-19. Online education has the potential to meet the learning needs of students enrolled in regular and distance education. More than 3.85M students are enrolled in regular education and more than 4.28M students have opted for distance mode of education (aishe, p. 22). The slogan of qualitative online education can be best achieved with designing, validating and sustaining effective moocs as required by 21st century learners. Any similar catastrophic situation like covid19 in near future may again disrupt the education sector, if within time, sincere and concrete steps are not adopted in developing India's online education based upon global quality, market relevance, and learners suitability.

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TRANSFORMING PARADIGMS OF EDUCATION: EXPLORING ODISHA'S 5T MODEL AND ITS EMPHASIS ON E-LEARNING

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ABSTRACT
The education landscape in Odisha, like many other regions globally, has witnessed a significant transformation in recent years. 5T model of education started with the objective to transform the governance system of education, which will essentially bring academic excellence, quality education, accountability, transparency and capacity building of students and teachers. This paper aims to explore the implementation of the 5T Model of education in Odisha and its role in leveraging digital platforms to enhance education. It aims to examine the strategies to contextualize the 5T Model within the governance of educational settings, emphasizing e-learning and online learning. Additionally, it seeks to identify and address challenges associated with the implementation of the 5T Model, offering insights into how these challenges can be overcome to facilitate its successful adoption in Odisha's educational system.
Keywords*:* Education, Odisha, 5T Model, E-Learning, Transformation

Introduction

Education is the cornerstone of societal progress and individual development which is underscored by the United Nations' fourth Sustainable Development Goal. The Indian and state governments have taken several structural and procedural steps, policy interventions, and initiatives to establish an inclusive environment and provide needed facilities and opportunities for educational development, and economic and social progress with a special focus on technology integration. In response to these critical mandates and the challenges posed in the sphere of education, the government of Odisha, a major state in India embarked on an innovative journey with the introduction of the 5T model of governance. This transformative model, built upon the pillars of Teamwork, Technology, Transformation, and Time, holds the promise of revolutionizing education in the state. Panda (2022) aptly commended Odisha's 5T initiative, recognizing it as a vital step towards achieving universal access to equitable quality education. Emerging studies support this view, portraying the 5T model as a beacon of hope in the pursuit of equipping learners with the essential skills demanded by the 21st century (Day and Halder, 2014). In this article, an attempt has been made to explore the paradigm-shifting by the 5T model of education and its special emphasis on e-learning and online education.

Objectives Of The Study

The objectives of the study are:

1. To study the ways to contextualize the 5T Model and its e-learning and online practices in school education.
2. To study the issues and challenges in the 5T Model of education with respect to e-learning and online learning.

Methodology

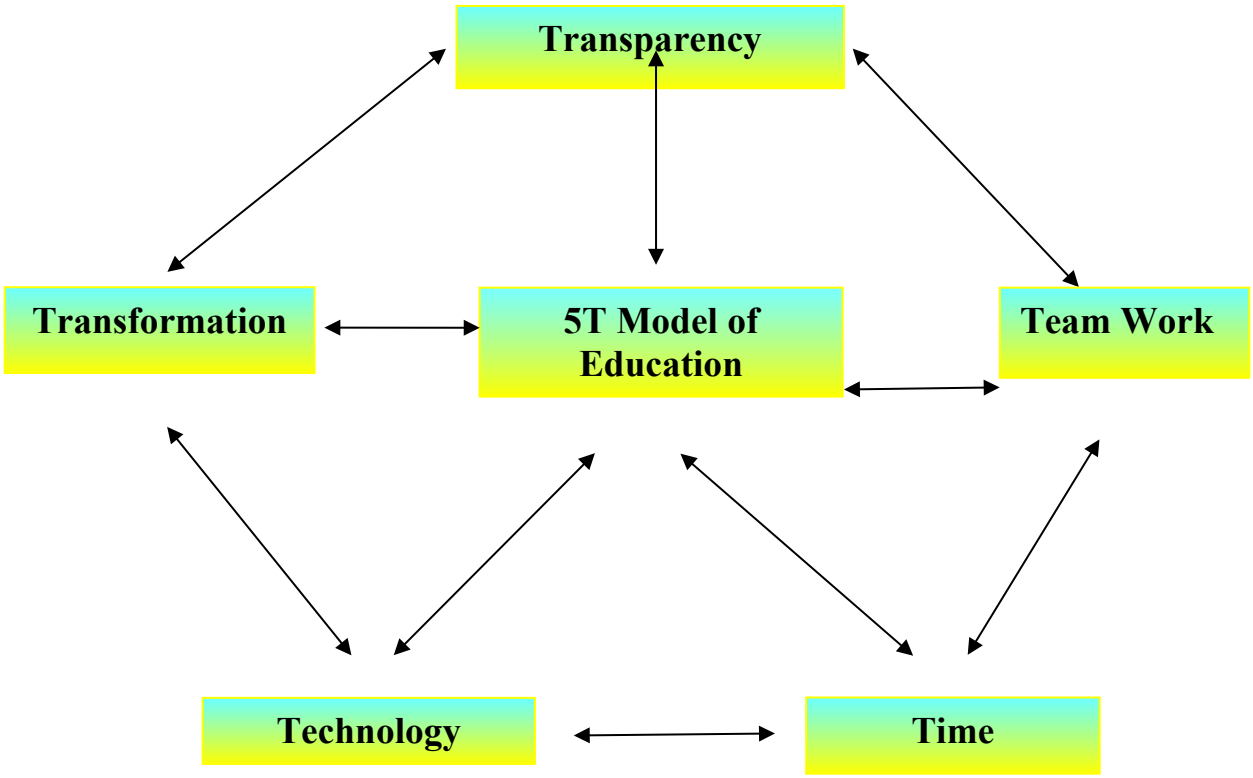
The study is based on resources available in open digital forms such as journals, research articles, magazines and authentic websites and explored from government documents. The Descriptive method was used to compile the content-based data and present the report.

5T Model of Education

The 5T teaching and learning model is a relatively recent innovation in education introduced in Odisha. 5T is

an acronym for Teamwork, Technology, Transparency, Transformation and Time. The main vision of 5T is to achieve academic excellence, providing equitable inclusive quality education, effective administration, management and capacity building of students and teachers through the implementation of Transparency, Teamwork, Technology, Transformation and Time in the field of school education and higher education. It is a highly individualized and collective teaching and governance model that focuses on preparing highly qualified, efficient, competent and effective teachers. It is a true teaching and learning model, offering a range of opportunities for e-learning and online education to develop teachers' and learners' teaching and learning skills in a beautiful learner- and study-friendly environment, as well as access to all basic and advanced facilities of e-learning and online education (Panda, 2022 & Das, 2022). Each phase of the 5T action plan from the point of view of contextualizing in school education and higher education are as follows,

Figure 1: Components of 5T Model of Education



Transparency: This is the most important dimension of 5T in accelerating quality education. The teachers are encouraged to make teaching transparent through the use of online and e-learning materials in their teaching. They must have clarity in his/her goals and accordingly select the right learning materials and transact it to students. The teacher needs to be clear about what he/she wants to develop and expect from each individual child and give each learner the same age regardless of their differences. The teacher should maintain transparency using e-learning in assessing and evaluating each and every learner. The teacher must use a variety of transparent tools and techniques in assessment and evaluation. The teacher not only focuses on the scholastic aspects of the learners but also on the co-scholastic areas. They need to focus on assessing each and every aspect of the learners for their overall development. School leaders and staff should provide transparency in maintaining school quality and standards, for which maintaining an effective relationship and coordination between staff and other educational stakeholders is essential.

Teamwork: This is the second most important dimension of 5T Model. In order to achieve the goals, we need to work together with love and collaboration is key to success. Each member of the institution works collaboratively as a chain every person is connected and has a role in achieving the goal. We need a strong foundation and connection like bricks and cement for building any building. Likewise in schools, both teaching and non-teaching personnel have equal roles to play. The head of the institution should not be autocratic but become flexible with each and every member, the head must treat every member with love, sympathy and honesty like a leader.

Technology: The third and most important dimension is technology. In 5T the top priority area is technology, the schools need to shift from the traditional chalk-and-talk method of teaching and learning to technology-based e-learning and online teaching and learning. Teachers need to use new and innovative technological teaching tools. Meanwhile, the teacher must not forget the importance of our ancient learning culture. Online and Blended modes of assessing and evaluating learners should be the top priority. At present, the Odisha government transforming the old traditional school classrooms into smart classrooms under this 5T model. Both in-school and out-of-school teaching and learning materials should be based on technology.

Transformation: The fourth major dimension is transformation, which encompasses the radical changes in education through the physical transformation of school buildings into smart schools, infrastructural changes from school desks to all facilities, and the development of a healthy, hygienic, learner-friendly and learner-friendly 5T school environment to facilitate learning. In order to facilitate changes in teaching methods and strategies, promote digital learning and online education, usher in a radical transformation in the roles of both teachers and learners and deliver positive effects on learning, educational transformation encompasses a comprehensive shift that includes changes in pedagogy and the learning process. Teachers are encouraged to transform their teaching and pedagogical skills through the use of technology to facilitate the learning process of teaching.

Time: The penultimate important dimension of the 5T educational model is time. Proper planning, preparation, management and supervision are required to complete the task and achieve the goal of teaching and learning on time. Therefore, the teachers are instructed to prepare the lesson plan and divide the lesson into daily, weekly, monthly, yearly basis and seasonal basis; teachers should write the lesson plan regularly and set a time limit for each task in order to effectively complete the lesson task on time. Adequate supervision is carried out timely to monitor the teacher's work, time intervals and school attendance. Teachers use various new, innovative methods and strategies for teaching and providing learning experiences so that the curriculum is successfully transacted in time. Setting both short-term and long-term goals, creating a flexible and systematic educational system, defining specific objectives and time frames, promoting collaboration between students, teachers, and stakeholders, utilizing feedback mechanisms to achieve educational goals, implementing quality management, control, and effective monitoring are the essential components of effective time management in 5T model of education.

Digital Transformation in Education Through 5T Approach

The 5T Model of Education represents a significant shift in the field of education, bringing about a number of advantages that transform traditional classroom approaches. A more convenient, efficient, and effective learning environment is provided by 5T smart classrooms, which are furnished with e-learning and online education resources. These cutting-edge settings simplify the teaching-learning process and eliminate complexity, creating motivated and engaged students. One of the main benefits emphasized by Panda (2022) in the article "Sikhya Byabastha O Sthiti" is the creation of a beautiful and learner-friendly environment that promotes pleasant teaching-learning. This paradigm also encourages teachers and students to embrace technology, fostering independence and self-assisted learning abilities. The 5T Model also promotes the growth of students' creativity, inventiveness, and untapped skills through technologically driven resources including well-equipped labs and electronic libraries. It also encourages collaboration, curiosity, and attentiveness through multifarious activities within and outside the school. Importantly, it addresses diversity and inclusion by enabling students who are at risk or have differing abilities to succeed in mainstream classrooms with their peers. In addition to this, it encourages the teaching of universal principles, as well as moral and constitutional education, and it expands access to educational opportunities in underserved and underdeveloped regions. In addition to offering counselling and counselling programmes for students and facilitating capacity growth through orientation and training, the 5T Model places a high emphasis on teacher and institutional integrity. In an inclusive setting, it reimagines courses to meet the needs of all students, including those with special needs. In essence, the 5T Model of Education brings a holistic transformation to the education landscape, making the teaching-learning process more effective, flexible, and technologically advanced. It equips students with a broad range of skills, knowledge, and competencies, fostering creativity, critical thinking, and a passion for learning in a modern, intelligent, and dynamic educational setting.

Discussion

Proper care and education are the fundamental rights of every child and a gateway to other rights (Karande and Kulkarni, 2005). For imparting quality education to schools' government of India has taken initiatives including Sarva Shiksha Abhiyan (2001), implementation of the Right to Education Act-2009, Rashtriya Madhyamik Sikhya Abhiyan (2009), Rashtriya Uchchatar Shiksha Abhiyan (2013), Smagra Shiksha Abhiyan (2018-19) and in spite of all the efforts "Education for all'' still remains a distant dream for many children in

India (Karande and Kulkarni, 2005). The first education policy of the 21st century the New Education Policy 2020 also focuses on providing equitable inclusive quality education to all from school education to higher education based on the foundational pillars of Access, Quality, Equity, Affordability and Accountability and equip the learners with the knowledge, skill and competencies that are needed to meet the needs and challenges of 21st century successfully. In the present context, the focus of education is shifting from traditional method education to constructive education in order to equip the learners with required knowledge, competencies and skills through inquiry-based education, experiential education, competency-based education and collaborative inclusive equitable quality education to promote each student's holistic development in academic as well as non-academic areas (NEP, 2020). In support of this government of Odisha amidst COVID-19, created history by starting an innovative initiative programme of 5T school transformation aimed at providing equitable inclusive quality education in a learner-friendly environment with all resource support. On his fifth term as Chief Minister Sri Naveen Pattanaik with the active supervision of V. K. Pandian, Secretary to Chief Minister (5T), on the occasion of the State-level Panchayati Raj Diwas on 05 March 2020 with the dream of empowering Odisha launched the 5T initiative programme (action plan for School Education and Higher Education). These five ingredients constitute the core element which is essential for providing quality equitable education and for its effective management and governance (Panda, 2020., Das, 2022 & Otv, 2022). In Vision 5T, Government of Orissa (2022), Chief Minister of Odisha Shri Naveen Patnaik, while explaining the 5T Charter, said: "I am forever grateful for the trust that people place in us. I would like to reiterate the three Ts of governance: Teamwork, Transparency, Transformation, and Technology. Add the fifth dimension - time. Time is of utmost importance. Today's youth are in a hurry - if we get international recognition in FANI, it will be for a timely evacuation. If we could complete the Asian Athletics Championships in 90 days. If only we could get 30, 0000 more women to join the Mission Shakti. In 15 days, I would like to introduce KALIA's efforts, which are highly evaluated nationwide. If we could ground near-universal coverage called Biju Swasthya Kalyan Yojana within 30 days. This is the place people want from their governance model. Today we have approved in principle the Part Manifesto as a government priority. 365 days later – on May 29, 2020, we will announce the results and achievements to the people. We know that some promises take time. I would like the Council of Ministers to do their best in this regard. We are currently going towards a brand-new, empowered Odisha where poverty was a thing of the past. Empowered Odisha – where women become equal partners in growth and development. Empowered Odisha – where our youthful dreams come true. The world should know that Orissa's time has come and our time begins now". NITI Aayog (2017) endorses the Odisha Government's 5T Charter stating that Odisha has adopted the 5T program to transform the education system, achieving the goal of all children having access to education in an age-appropriate classes and learning in a favourable, supportive, and engaging school environment. Panda (2020) also highlights in the article "*Sikhya Byabastha O Sthiti*" that the 5T initiative is the most remarkable welcoming step of the Odisha government, and it will ultimately lead towards the development of the education system in the state. Day-by-day in the state schools seem like a movement from scatter plots to butterflies. It helps in a new and constructive way in accelerating students to learn in a new and constructive way which helps in holistic development of school and learners. Some schools under 5T are well developed, transformed, and well equipped with infrastructure and other facilities with beautiful learner-friendly environments, other hand other schools are in a destructive situation and are neglected. Also emphasizes phase-wise transformation of other rest schools. At the district level collectors and other competent retired teachers and authorities need to be sensitized to make a committee which will assist the teachers by going to schools to give proper guidance and training. Initiatives need to be taken for awarding skilled and competent teachers for their contributions. Schools including primary need to be included in the 5T school transformation, it will ultimately bring a revolutionary change in the education system. Das (2022) appreciated the Odisha government's Mo Sarakar initiative under which 5T implementation should bring a drastic change in developing an education system in which every learner feels empowered and gets equitable good quality education and emphasizes this 5T initiative needs to be implemented in different sectors such as education, telecom, cyber security, public grievance redress, tourism, investment, trade, land records and disaster management.

Issues and Challenges in e-learning and online education through the 5T Model

Within the framework of the 5T Model of education, there exist a multitude of serious issues and constraints that necessitate solutions in order to achieve its effective implementation. Primarily, there exist concerns over the physical and mental well-being of students. Prolonged exposure to screens and insufficient illumination might give rise to health-related complications, such as ocular discomfort, and could contribute to decreased student involvement as a consequence of monotony. In addition, the rapid adoption of the 5T Model frequently overshadows conventional instructional approaches, potentially resulting in a dilution of educational identity. One of the primary obstacles is the veracity of digitized educational resources. The proliferation of inaccurate information is facilitated by the uncertain credibility of internet resources, which has the potential to mislead

those seeking knowledge. The abundance of online information sources can be overwhelming for both students and instructors, leading to challenges in curriculum management and generating misunderstanding. Technological challenges provide a substantial barrier as well. Fragile equipment, such as lighting systems, may be susceptible to damage, resulting in significant expenses associated with maintenance. Furthermore, it should be noted that not all students or educators possess the requisite knowledge and expertise to effectively utilize technology, and this deficiency in technological competence might potentially serve as a source of distraction. Over-dependence on technology might result in the development of passive learners who are unable to effectively demonstrate their true capabilities and talents. Moreover, it is plausible that excessive usage of technology might contribute to the development of technology addiction, hence leading to behavioural issues that impede the expression of innate capabilities. The financial dimension of the 5T Model presents an additional challenge since it necessitates significant expenditures in terms of training, equipment, and materials. Proper resource management, particularly in terms of utilization and upkeep, demands specific knowledge and abilities. In a technologically driven educational setting, the presence of communication gaps between learners and teachers can be exacerbated, leading to a perceived lack of authenticity and less engagement in the learning process. Moreover, an excessive focus on technology might potentially result in the disregard of conventional pedagogical approaches. The 5T Model of education has significant opportunities for enriching learning experiences, but it also presents a multitude of concerns and obstacles. It is important to acknowledge and tackle the aforementioned obstacles, including health-related issues, the vulnerability of technology, and the necessity for adequate training, in order to fully exploit the advantages of technology in the realm of education and establish a well-rounded and efficient learning milieu.

Conclusion

The 5T initiative of the Odisha Government is a very important, innovative, welcome step in accelerating growth, development, achievement of academic excellence in education, and effective management, administration, supervision and capacity building of teachers and students. 5T is a philosophical and network-based concept that requires continuous interaction in and between the 5T components, namely transparency, technology, teamwork and time, contributing to a radical transformation in education by creating opportunities for equitable and quality inclusive education for all bids. It is an excellent and innovative model for building skills, boosting confidence and offering a variety of experiences with special emphasis on developing competencies, creativity and constructive thinking of teachers and learners, helping teachers to enhance learning through the use of multiple ways of teaching, learning, assessing and evaluating the learners. It is also an effective, inclusive transformation and governance model with an efficient management, monitoring, monitoring and feedback mechanism to ensure better delivery of public education services.

Recommendations

5T model can be used in pre-service and in-service teacher education programmes to improve the knowledge, competencies, and pedagogical teaching abilities and skills of teachers. It can be applied in the education sector to provide quality education at all levels, including nursery, primary, upper primary, secondary, and higher secondary schools, colleges, and universities in both rural and urban locations phase-wise. 5T may be proactive in designing and selecting content, courses, selection of learning experiences, organizing content, organizing learning experiences and selecting and using assessment, evaluation devices and feedback mechanisms in the field of education. It can aid in boosting enrollment, lowering illiteracy rates, and decreasing learners' dropout rates. It can be applied in providing vocational training and technical education to learners. Steps should be taken to break down social and physical barriers in schools by creating a beautiful, conducive learner and learning-friendly environment, nurturing national identity, and fellow feeling, and fostering the development of constitutional, moral, ethical, and spiritual values through the implementation of 5T in schools and colleges. Additionally, this model can be applied in a variety of fields, including medicine, rural development, housing, skill development, tourism, cyber security, security services, telecom, public grievance redress, investment, trade, industrial development, sports, mining, road development, heritage conservation, disaster management, agriculture, food security, trade, land records, and many more.

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UNDERSTANDING THE MISE-EN-SCENE IN ROMANTIC MOVIES OF MANIRATNAM & PC SREERAM COMBINATION ACROSS DECADES: A COMPARATIVE ANALYSIS

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ABSTRACT
Mise-en-scene is one of the important elements in any film to give the proper visual appeal to the audience. Representation of mise-en-scene in romantic movies plays a vital role in sensitizing the story to make the audience feel connected with the movie. This study has made an effort to comprehend how the setting is depicted in the romance films that filmmaker Maniratnam and cinematographer PC Sreeram collaborated on. Three films with the same plot that portrayed the social reality of love and marriage life at the time were chosen as a sample to examine how the director's and cinematographer's filmmaking skills have changed over three decades. In this study, content analysis was the chosen research methodology. Two key factors, such as the filmmaker's characterization style and the cinematographer's cinematography style, were investigated. The study's findings revealed that the director prioritised societal themes from the era while portraying romance in the film. In all three films, the differences in characterisation and attire are clear. Men and women in the film are given an equal amount of screen time by the director. Regarding cinematographic techniques, most of the perspectives and shots are the same for all characters. However, as a result of technical advancement, different equipment is used, which changes how films are framed.
Keywords: Mise-en-scene, romance, cinematography, Maniratnam, PC Sreeram

Mise-en-scene

"Mise-en-scene" refers to any aspect visually presented by the theatre within the room offered by the stage itself (Moura, 2014). Filmmakers have taken the phrase and expanded the significance to say that the director controls the visual elements in the shot (Setyawan et. al., 2020).

The environment, the costume, the illumination, and the action of the figures are four elements of the setting that parallel the physical art of the theatre. These elements are also adapted to film and mise-en-scene represents how the setting and different elements are put together to create a frame for each scene (Bordwell & Thompson, 2003). The film director uses these elements to create a lively and sharp memory for his viewers. Mise-en-scene explicitly and implicitly directs our interpretation of narrative events. Mise-en-scene elements are Sets, Props, Lighting, Costumes, Actor blocking, Shots, composition, and so on (Lathrop, 2014). Mise-en-scene involves visual composition, the movement and position of on-screen actors, and the props set as part of stage design (Barsam & Monahan, 2010). It delivers the mood of the story and conveys proper meaning to the visuals (Sreekumar & Vidhyapeetham, 2015).

Talking about the mise-en-scene, an important thing to consider is the filmmaker's storytelling method in composing the frame. When each frame and shot are combined, the story narration gets into its place based on the director’s flow. Storytelling in films determines that the audience is exposed to characters, environment, and setting to get into and feel the narrative style of the film (Shrum et. al., 2010). This proves that the understanding of the audience and building their perception of films shape based on directorial touch in setting elements in the frame. Hence, mise-en-scene is considered one of the important film analysis approaches which helps to understand the visual impact and depth of the elements present on the screen (Dandekar, 2021)

Cinematography Elements in Mise-en-scene

Cinematography is an important aspect of filmmaking. It is the process of capturing the elements present in front of the camera lens to create a moving image. These moving images are aesthetically presented based on the setting and elements framed before the camera (Mena & Prabha, 2021). Cinematographic elements such as shots,

angles, framing, perspective, and depth are important in understanding the scope of visuals in film analysis research (Benini et. al., 2010).

The language of cinematography is more subjective. It deals based on the different angles, movements, scales, and framings that are set up in the camera. When aspects change, the interpretation of one's perspective also becomes different (Goncalves et. al., 2013). Visuals help to boost realistic images more colorful and lively for better consumption by the audience (Kodak & Felicia, 2015).

There are important elements in cinematography concerning understanding mise-en-scene. They are light, color, setting, and costumes. The use of light will help the environment to enhance its existence and helps to develop the mood and depth of the movie (Mochama, 2020). Color is considered to be an important element that helps to set the tone of the scene. This tone-setting helps to set the inner meaning and also to showcase the emotions based on the theme (Redmond, 2014). Setting includes space and time. It is the time/period shown in the film, as well as the properties present in the frame. Setting also helps with the placement of characters, properties, decorations, and so on (Moura, 2014). Costumes on the side help to enhance the physical representation of the character in the film. The appearance of the character communicates a significance that a story generally demands. Hence, the costumes are done based on the nature of the characters and their importance (Mena & Prabha, 2021).

Characterization in Mise-en-scene

Characters in films and their representation is another major aspect of mise-en-scene. It is the central figure which drives the motion of the scene (Lutters, 2004). The framing of characters by the filmmaker and bringing them visually by the cinematographer held a major space in filmmaking. The understanding between the filmmaker and cinematographer becomes pivotal in visualizing the character successfully on the screen. Characters generally interact in a meaningful manner to show the film content. Generally in film studies, the study of character becomes the basis way of examination (Sang, & Xu, 2010).

There are many types of characters present in the film. But, primarily protagonist and antagonist play a major role and occupy the major space in the film associated with supporting characters. The protagonist is the major person in building the story entirely who runs from beginning to end of the story (Pratista, 2008). Generally, there will be one, rarely two protagonists present in the film based on the storyline. Understanding such characters helps the researcher to know the directorial touch of the filmmaker.

Two elements are considered important in projecting the characters in the films. They are costumes and their acting. Costumes help for shaping the identity of the characters (Barzel, 1997) and the choice of costumes for different characters conveys a special meaning and message delivered (Barbieri & Pantouvaki, 2016). Acting becomes important in studying the characterization aspect of mise-en-scene in films because it is the face of the film. The different types of activities a character engage in set the mood of the film (Sreekumar & Vidyapeetham, 2015).

Romantic Films

Dowd and Pallota (2000) said that romance is a kind of adventure of a chivalrous knight in the olden days and later it is considered a love affair between two people. Romantic films are love stories or heart affairs that focus on the desire, feeling, and love of the main characters (usually the leader and lady), and the path that their love undertakes through courtesy or marriage. The main focus is on romance films, love tales, or love quests. It is the process of being together or setting apart from each of the loved ones (Darliati & Mahmud, 2020). Romantic films also address at first glance the basic concepts of love, youthful (and older) love, unrequited love, obsessed love, divine love, unlawful love, sexual and love of lust, sacrificial love, explosive and devastating love, and catastrophic love.

Romantic films act as great dreams for the audiences, in particular, if the two characters eventually solve their challenges, pledge their love, and experience life 'happy ever after.' Romantic films create parasocial relations among the audience. An audience can be able to relate and develop a relationship with the mediated person in the romantic film (Jayasainan et. al., 2014)

Kollywood (Tamil Film Industry) has a long history of producing romantic movies since its inception. It is one of the biggest film industries in India, especially in South India (Antony, 2016). Before the 1940's many movies in Kollywood highly falls on the side of patriotic, dramas or a great rivalry. The late 1950s saw the biggest monarchs of Kollywood M.G. Ramachandran, and Sivaji Ganesan has started ruling the industry in the latter half of the twentieth century Gemini Ganesan has become famous for romance and was called "Kadhal Mannan"

(Love King). When the industry started growing in the next coming years Rajinikanth and Kamal Hassan has become famous and romanticism has also become one of the prevalent elements in their movies. Especially Kamal Hassan takes the lead in romantic movies during that time. Kollywood has more films that adore romance beautifully by different filmmakers (Nandakumar & Jenitha, 2023)

Mani Ratnam and PC Sreeram

Mani Ratnam is a well-known Indian Film Maker, Screen Writer, and Producer. He is one of the finest directors in India who directed films in Tamil such as Mouna Raagam (1986), Nayagan (1987), Anjali (1990), Thalapathi (1991), Iruvar (1997), Kannathil Muthamittal (2002), Yuva (2004), Guru (2007). He is highly acclaimed for showing the extreme edge of romance in movies with decency. His prominent movies such as Mounaragam, Roja, Bombay, Alaipayuthey, and O Kadhal Kanmani are considered the best romantic drama in Kollywood. His sense of movie direction touches reality by considering the different social elements which apply to all sets of audiences (Mena & Prabha, 2021). His recent work 'Ponniyin Selvan' is one of its trademarks.

PC Sreeram is one of the well-recognized cinematographers in the Kollywood industry. He is well-known for his exceptional method of setting lighting and aesthetic frames that make the visual artistic and appealing to the audience watching the movie on the screen. He has functioned as a cinematographer for Tamil, Telugu, Malayalam, Hindi, and Kannada languages. He is also a successful filmmaker who directed films such as Meera, Kuruthi Punal, and Vaanam Vasapadum.

Maniratnam and PC Sree Ram combination is considered to be one of the best in Kollywood, especially in romance drama. Both of them have worked in nearly seven movies over the years. They are Mouna Ragam, Nayagan, Agni Natchathiram, Geethanjali, Thiruda Thiruda, Alaipayuthey and O Kadhal Kanmani. Out of this, three movies such as Mouna Ragam(1986), Alaipayuthey (2000), and O Kadhal Kanmani (2015) are romance dramas and have almost similar plots – fundamentally defining urban romance and the issues involved with it and youth problems.

Making a movie with similar plots indeed needs strenuous effort in terms of lighting, frames, characterization, generation gaps, and technological development. Also, it is important to keep the audience engaged throughout the film – only if the movie has some uniqueness from the other film, will it attract the audience to sit throughout the movie. All these aspects are crucial to the successful run of a movie with similar plots. The movies collaborated by PC Sreeram and Mani Ratnam have an artistic and authentic approach that fascinates the audience to watch the movie. Especially Maniratnam movies have created mise-en-scene exploration and the usage of its elements has ended up in suitable narration and exposing creativity on screen (Mena & Prabha, 2021). Hence, this study was conducted

1. To analyse the mise-en-scene in Mani Ratnam and PC Sreeram's collaborated romantic movies in the film industry.
2. To study the influence of PC Sreeram cinematography styles in Mani Ratnam's movies.
3. To understand Mani Ratnam's description of the characters in his romantic drama.

Methods & Procedure

The qualitative research method was used in this study. As per Flick (2014), the qualitative method helps to understand the underlying dimensions and structures in the visuals in-depth. Content analysis was used as the primary method to understand the mise-en-scene in Maniratnam and PC Sreeram Combination movies across decades. The sample frames of the study are the romantic movies of Director Mani Ratnam and Cinematographer PC Sreeram combination. The sampling technique involved is purposive sampling. The following were the criteria used for selecting the sample movies.

- The movie should be directed by Mani Ratnam
- Movies cinematographer should be PC Sree Ram
- Movies genre should be romance
- Movies should be in Tamil language
- Movies should have been released between the 1980s to 2020.
- The plot of the movie should resemble the similar storyline/romantic genre

Based on the criteria, three movies selected are samples for the study. They are

1. MOUNA RAGAM (1986) - The movie focuses on the characters Divya (Revathy), Chandra Kumar (Mohan) and Manohar (Karthik). Divya is forced by her family to marry Chandrakumar. Her reluctance is due to her past relationship with the late Manohar.
2. ALAIPAYUTHEY (2000) - The movie focuses on young lovers who get married without their parent's blessings and leave their respective homes to start a new life. It stars Madhavan asKarthik

and Shalini as Shakti, the runaway couple.

3. O KADHAL KANMANI (2015) - The movie focuses on Adhitya, a game developer, and Tara, an architecture student, both of whom decide to pursue a live-in relationship.

Variables

Two categories of variables such as the characterization of Maniratnam and the cinematography style of PC Sreeram was selected in the study to understand how the combination has evolved over the decades in representing romance in their movies.

To understand the characterization, the type and costumes of the characters represented in movies are studied. To study the cinematography styles, angles, shots, equipment, and lighting techniques used by the cinematographer in movies are studied.

Coding Procedure

To study the cinematographic variables, the coding sheet was used based on numerical identifications for each shot in the scene are followed. A similar method is followed for equipment, lighting, and angles. Then the results were consolidated and the frequency chart was created to identify the results.

With respect to character and costumes, the definition of each type of character (dynamic, round, flat, static, stock, character) was identified which subsequently derived the result for the character role variables. The analysis also covers the frequency of the variables which was used to write a detailed mise-en-scene report of the movies in the sample frames

Results

The result section discusses the findings from the content analysis of all three movies selected. The frequency of the items present is also discussed.

Cinematographic Styles

Angles used

Mounaragam Movie

For Chandra Kumar and Divya, 95% Eye level angles are often used in mouna ragam for conversation, sentiments, and serious scenes which make the viewer feel within the scene. 65% High angle shots are used for male characters, especially for the primary male character Chandra Kumar which conveys strong emotions and importance. 70% Low angle shots are used to portray women lead character Divya, which conveys the power, and boldness of the character. In mouna ragam 2% Dutch angles are used. 45% Over-the-shoulder shots are used for conversation scenes in the movie.

For Manohar and Divya, 50% Eye level angles are often used for conversation scenes. 20% High angle shots are used for male characters, especially for the primary male characters Manohar and Chandramouli (father character) in the movie. 60% Low angle shots are used to portray Divya when the interaction happens with Manohar.

Alaipayuthey

98% Eye level angle is used for primary and secondary characters in Alaipayuthey movie. 55% High angle shots are used for male characters, especially for the primary male characters. 70% of Low-angle shots are used to portray women lead characters. 30% of the movie has a side angle which portrays the disorientation between the couples. 45% Over the shoulder shots are used.

O Kadhal Kanmani

98% of Eye level angle is used in O Kadhal Kanmani for conversation, sentiments, and serious scenes. 55% High angle shots are used for male characters in this movie and it depends on the scene. 80% Low angle shots are used to portray women lead characters. 60% of the movie has a side angle which portrays the disorientation between the couples. 8% Dutch angles and 45% Over the shoulder shots are used

Shots used

Mounaragam Movie

25% extreme wide shots are used for Chandra Kumar and Divya's character, which portrays the location of the scene. 55% long shot/Wide are used for primary characters which helps to establish the subject wide with the location and space. A 10% full shot is used to fill the space with the subject fully head to toe in the frame. 75% of medium shots are used for Chandra Kumar and Divya characters to visualize the emotions with body

language. 50% of Close-up shots and 20% of extreme close-ups 50% are used to capture the emotions of the character.

With regards to Manohar and Divya scenes, 10% extreme wide shots are used which portrays the location of the scene. 45% long shot/Wide are used for primary characters which helps to establish the subject wide with the location and space. 65% of Medium shots are used for exploring emotions. 20% of Close-up shots and 10% of Extreme close-ups are used to capture the emotions of the character.

Alaipayuthey
30% extreme wide shots are used for Karthick and Shakthi's characters, which portrays the location of the scene. 55% long shot/Wide are used for primary characters which helps to establish the subject wide with the location and space. A 5% Full shot is used to fill the space with the subject fully head to toe in the frame. 80% of Medium shots are used for Karthick and Shakthi characters to visualize the emotions with body language. 50% of Close-up shots. 10% Extremely close-ups 50% is used to capture the emotions of the character.

O Kadhal Kanmani
30% extreme wide shots are used for Aditiya and Tara characters, which portrays the location. 35% long shot/Wide are used for primary characters which helps to establish the location. A 5% Full shot is used to fill the space. 80% Medium shots, 40% of Close-up shots, and 30% Extreme close-ups are used in O Kadhal Kanmani

Equipment used
Mounaragam Movie
60 % of Tripods, 50% of Steadicam, 10 % of Pedestals, and 40% of Camera dolly equipment are used in mouna ragam.
Alaipayuthey
80% of Tripods, 50% of Steadicam, 10 % of Pedestals, 40% of Camera dollies, and 20% of crane equipment are used in Alaipayuthey.

O Kadhal Kanmani
98% Tripod, 16% Steadicam, 15 % Pedestals, 80% Camera dolly, and 5% crane equipment are used in O Kadhal Kanmani.

Lighting Technique used
Mounaragam Movie
70% of Key lights are used for both Chandra Kumar and Divya as well as Manohar and Divya characters. 30% Back Light is used for Manohar and Divya characters. 15% of Natural light and 40% of Ambient light are used for both Chandra Kumar and Divya as well as Manohar and Divya characters. 10 % Spotlight and 25% Fill lights are used in other scenes in Mouna Ragam.

Alaipayuthey
70% Key light, 30% Back Light, 15% Natural light, and 40% Ambient light are used for Karthick and Shakthi characters. 10 % of the spotlight and 25 % of Fill lights are used throughout different scenes in Alaipayuthey.

O Kadhal Kanmani
90% of Key lights are used for Primary and Secondary characters. 50% Back Light is used for Aditya and Tara. 35% Natural light, 60% Ambient light, 25 % Spotlight, and 45 % Fill lights are used in O Kadhal Kanmani.

Characterisation
Mounaragam Movie
The analysis of the movie results shows that the Primary characters in the movie are either dynamic, flat, or round characters. The character Divya (Revathi) is a dynamic character that can be seen through the plot. The character is established enthusiastically at the beginning of the film which moves to a pessimistic side of the character during the rise of the plot and then breaks out to an optimistic side which delivers a perfect character arc.

Alaipayuthey
The analysis of the movie shows that the Dynamic characteristics can be observed in both male and female protagonists which shows the keen perspective of the director Mani Ratnam.

O Kadhal Kanmani

The analysis of the movie found that the male lead Adithya is a stock character and we can observe his mindset for animation the female lead Tara character is a round character she is confused and complex which changed the storyline.

Costumes

Mounaragam Movie

The costumes are chosen depending on the storyline, which includes the character's actions, age, and height. The first character Divya (Revathi) wears Western attire such as a churidar and salwar. As soon as she marries, her attire becomes more formal (Saree). This variation is due to the complex nature of the characters in the plot. Similarly, Chandra Kumar wears formal shirts and pants.

Alaipayuthey

When it comes to the costumes, the heroine's costumes are designed with more vibrant colors which express the joys. Shakthi can be seen in churidars pre-marriage and post-marriage it can be noted that she wears sarees which explains the director's point of view on the character.

Grey, blue, and orange tones are predominantly used throughout the movie with which blue represents loyalty which is seen in the climax when Shakthi asks “bayandhutiya” to which Karthik replies “Uyirae poiruchu “. Grey tones can be seen during their separation which portrays a dark emotion between the hero and heroine. The film can be seen in the orange tone where the couples are happy.

O Kadhal Kanmani

In O Kadhal Kanmani, the male lead Adithya wears a modern costume like jeans and a T-Shirt. The character's costume color is Red, Yellow, Black, and White. In O Kadhal Kanmani, the female lead Tara wears a modern costume and the costume color is Red, Yellow, Black, and White. Yellow, green, and pink color tones are exploited throughout the film to support the plot arc.

The pink tone in the movie identifies the lust between the couples, whereas the green tones indicate a soothing and healthy relationship and the yellow tone establishes love and happiness between the couples. The Movie as a whole has a lot of differences when compared with other romantic movies Mani Ratnam and PC Sreeram. Animation sequences can be seen throughout the movie which shows the technological adoption of the director. Since the movie is set in a modern scenario, the costumes are modern throughout the movie and are designed with energetic colors.

Discussion

Each movie has used and showcased characterization and cinematography concepts in their ways, with a few additional unique features according to the storyline. Mani Ratnam is known for his characterization and storyline. And also he has a special quality of visualization which motivates the viewers to watch his films without getting bored. Like PC Sreeram is unique in his way of cinematography. He is well known for his Lighting, Framing, and Composition. When these two legends combine in one movie it reaches high trend-setting and also in box office collection. Though the movie Mouna Ragam, Alaipayuthey, and O Kadhal Kanmani analysed in this research has been released at different times, there is a similarity between the storyline of all three movies. All three movies spoke out about the relationship aspects between men and women during different periods. Especially, the nature, complexity, resolution, and modernism of the relationship between men and women according to the time were dealt with in detail in all three movies.

Mouna ragam

In Mouna Ragam, the character Divya (Revathi) has a majority of low angles and medium, close-ups shots, and over-the-shoulder shots. The reason to use low angles is to convey the Divya character's boldness, and rights to his father Chandramouli, and his husband Chandrakumar. The character Chandra kumar(Mohan) has the majority of high angles and medium close-ups shots and over-the-shoulder shots. Eye Level angles are the majorly used angles for both characters to convey the reality and pureness of the relationships between the primary characters.

Over-the-shoulder shots involve both the characters' presence in a cut-to-cut concept. Over-the-shoulder shots and Medium shots are used to portray the depth of relation between the characters. Medium shots are often used in conversation scenes between them. Close-up shots are used to convey the emotions of both the characters. Close-ups are used as an insert shots for medium shots. The movie has extreme close-ups and wide shots. The majority of extreme close-ups shots are for the female lead Divya to convey extreme emotions like crying, smiling, longingness, and pain. Mouna ragaam has the majority of stable shots, which have been shot using Tripods. The movie also used Dolly equipment for slight movements like Dolly in and Dolly out. Dolly is used

in very emotional scenes and also in travel-based scenes. Mouna ragam is unique because of its way of lighting technique. Mouna ragam has the majority of single lighting and comparatively three-dimensional lighting. Most of the scenes have key light alone. The key light is used for both characters Divya and chandra kumar to portray the darkness, and between Divya and chandra kumar to portray loneliness. PC Sriram movies are known to have more natural and ambient lights. Mouna ragam also involves nature and ambient lights in 50% of the scenes. Ambient and natural lights are literally used as three-dimensional lighting.

With reference to characterization, Divya is a dynamic character and chandra kumar is a flat character. Divya's character has lots of changes in the storyline, when she is a teenager, a happy going college student and she will fall for Manohar and later he will be dead. After that, she will be somewhat forced to be married to Chandra kumar where she will be accepting the reality and after marriage that she will keep her distance from her husband. Later she reveals her past and she requested to get a divorce. But in the end, she will be changing her mind to lead a happy life with Chandra Kumar. This character has lots of ups and downs. The character has lots of internal changes both mentally and physically. When it comes to Chandra kumar he is gentle and a working man, who marries Divya to lead a happy life, Even though she has a horrible past, he will be accepting her as she is and will be wishing her to lead a happy life with him. But she refuses his proposal. But still, he will be loving her and in the end, they will fall in love. So this character is to suttle and he won't change.

Divya characters' costumes are more like dynamic characters when she is at college she will be wearing modern costumes like chudidhar and salwars. And after her marriage, she will be majorly wearing traditional costumes like sarees. Chandra Kumar will be in formal costumes like pants and a shirt and at home he will be wearing kurtas. Mouna ragam is full of warm tone colors and Divya's costume colors are red, white, yellow, and black and Chandra kumar costumes are white, sandal, and green. When it comes to Divya and Manohar characters the majority of shots are medium shots and the majority of angles are Eye level angles. For this character majority of shots are taken using tripods and minimal usage of dolly in and dolly out. Manohar wears modern costume pants and shirts and his costume colors are majorly blue, white, and black.

Alaipayuthey

Alaipayuthey is more like Mouna Ragam in its making but it also has a few unique elements. In Alaipayuthey, the character Shakthi (Shalini) has the majority of low angles, medium, close-ups shots, and over-the-shoulder shots. The reason to use low angles is to convey the Shakthi character's boldness to his father and his husband Karthik. The character Karthik (Madhavan) has the majority of high angles and medium close-ups shots. Eye Level angles are the majorly used angles for both primary characters to convey the reality and pureness of the relationships between the characters.

Over-the-shoulder shots involve both the characters' presence in a cut-to-cut concept. Over-the-shoulder shots and medium shots are used to portray the depth of relation between the characters. Medium shots are often used in conversation scenes between them. Close-up shots are used to convey the emotions of both the characters. Close-ups are used as an insert shots for medium shots. The movie has extreme close-ups and wide shots. Alaipayuthey has the majority of stable shots, which have been shot using Tripods. Dolly is used in emotional and travel scenes. Crane majorly used for both characters in the frame. Crane shots have been used to show the separation of the couple and establish the locations.

Alaipayuthey has the majority of three dimensional. Most of the scenes have key light fill and backlights. Key light is used for both characters where fill light and back lights are used to make the background perfect. In a few scenes natural and ambient lights are also used.

The character Shakthi (Shalini) is a Round character and Karthik Madhavan is a dynamic character. Shakthi's character is a medical student and she is a funny and naughty woman. She will later fall in love with Karthik. After many struggles, they will get married. At first, they lead a happy and peaceful life but later they had some misunderstandings. In the end, Shakti and Karthik make a reunion. So the Shakti character has a lot of changes from her parallel character. Similarly, the Karthik character is dominant and this character travels parallel with the Shakthi character. And Karthik will also change a lot internally, so his character is termed as a dynamic character.

Shakthi character costumes are according to her profession (doctor) and modern where at first she will be wearing a medical coat and churidar and after she gets married she will change to a sarees. And Karthik's character is modern throughout the movie where he will be full in pants and shirts and t-shirts. The color tones for this movie are warm, daylight tones which represent the happiness of the characters. This movie has a grey

tone which represents the separation of the couples. And blue tone which conveys the loyalty between the couples.

O Kadhal Kanmani

In O Kadhal Kanmani, the character Tara(Nithiya) has the majority of low-angle, medium, close-up, and over-the-shoulder shots. The reason to use low angles is to convey the Tara character's uniqueness, innocence, and freedom. The character Adithya (Dulquer Salman) has the majority of eye level angles, medium close up, and over-the-shoulder shots are used. Eye Level angles are the majorly used angles for both characters. Over-the-shoulder shots involve both the characters' presence in a cut-to-cut concept. Over-the-shoulder medium shots are used to portray the depth of relation between the characters. Medium shots are often used in conversation scenes between them. Close-up shots are used to convey the emotions of both the characters. The movie has extreme close-ups and wide shots. O Kadhal Kanmani has the majority of movement shots that have been shot using Steadicam and gimbals. The movie also used Dolly and crane equipment for slight movements in a few scenes. A lot of scenes are also taken in handheld cameras with a bit of shake in the videos.

O Kadhal Kanmani has three-dimensional lighting and two-way lighting majorly. In this, movie PC Sreeram has used a different technique for lighting the subject. He used to bounce the natural light(sunlight) which is in the back of the subject and he bounced the light to the subject using reflectors as a key light. This makes the subject soft and glow. And also key and fill lights played a major role in the movie

Tara (Nithya) is a Round character type and Aditya (Dulquer Salman) is a stock character. Tara is a fun and enthusiastic architecture student who is typically a modern woman with modern thoughts. Her major concept is not to get married. She is a little bit short-tempered. She accidentally sees Adithya at the railway station. Later, she meets Aditya at a wedding function. After that, they became friends and started talking about a live-in relationship. They both mutually agreed to live in relationship concepts but they both cannot keep up with their terms and in the end with the impression of Ganapathy and Bhavani couples in the movie they both decided to get married. This all happens with a few emotional dramas inside it. So here Tara will be often changed according to the storyline. So, her character is round and Adithya is a little bit selfish and stereotypical in work and relationship. So he is termed a stock character.

Tara's costumes are modern wear like kurtas, palazzos, and leggings. And Aditya's costumes are also modern costumes like t-shirts, shirts, jeans. Tara's costume colors are light colors like Yellow, Green, Sky Blue, Pink, and Black. Adithya uses more Red, White, Black, and Blue. The color tone majorly used in this movie is an orange tone where the couples are happy. The Pink tone is used to represent the Lust between the couples. And Green tone is used to represent the healthy relationship between the couples.

Comparative Analysis between three movies

In conclusion, Mani Ratnam and PC Sreeram, both have been successful in entertaining the mass audience with their magical narration and depiction skills. The movies, Mounaragam, Alaipayuthey, and O Kadhal Kanmani all share a genre and narration style in common. Though the stories are projected differently, the movies have similar plots, essentially consisting of conflict between the hero and heroine, and how they overcome the same to live happily ever after. The conflict is mostly a misunderstanding that develops due to external factors. Although the narration and cinematography, with its unique twists and turns, take the audience through a fairytale.

The character establishment of male and female in the movie has been split equally. The male character is mostly a naughty, playboy kind and a trendsetter, making him an ideal lover. The female character is set as rather responsible, powerful, and a decision-maker. In the movie Mounaragam, Mohan is portrayed as a subtle, middle-aged, and mature person compared to Karthik from the same movie as a funny, trendy, and romantic person. The movies mentioned above mostly depict daily societal issues and women's insecurities. In the movie O Kadhal Kanmani, the story revolves around the upcoming culture (live-in relationships). The movie portrays how two youngsters decide to live together before marriage and face each other as well as their surroundings. The costumes used in the movies for male and female characters vary with the movies throughout the years. Over the years, the characters have adapted to the trend of that period.

The cinematography is split into three decades. The First Decade – In the movie Mounaragam(1986), the equipment and technology were limited. They made the movie with stable shots and used a light dull tone for unlikely events in the movie and an orange tone to depict joyful situations. The second decade –In the movie Alaipayuthey(2000), there was advancement in technology and equipment utilization. Hence, the movie was created using various types of shots and angles. The lighting used in the movie was also rather pleasant and attractive compared to the movies created in the first decade. The third decade –the movie O Kadhal Kanmani,

the movie saw the usage of equipment such as a gimbal, crane, etc. which was rather new to the industry. The movie is set in a modern world and so the color tone was principally yellow and blue depending on the situation in the movie.

Conclusion

The story exhibits the Mani Ratnam and PC Sreeram way of filmmaking that always attracts the audiences with their unique style of visualizing things. This study provided insights into the romantic movies of Mani Ratnam and PC Sreeram combo movies. The result of the study shows that the movies over the three decades have almost similar plots with some twists and turns. The relationship conflict between the hero and heroine, and their overcoming strategies across different periods are depicted in all three movies. In line with romance, the director also dealt with the social issues of each movie's period. In Mouna Ragam, the problem was about women's insecurities and family problems, while in Alaipayuthey, the problem shifted over register marriages which were unpopular during that period, and in O Kadhal Kanmani, a huge shift over to the problem of live-in relationships and its impact in the society. These three movies have created a huge difference in portraying the problems and solutions to personal problems between the characters as well as external factors affecting them.

Limitations and Future Research

The study was limited to a decade-long examination of a romance film in Kollywood. For this study, a successful filmmaking squad of Mani Ratnam and PC Sreeram is studied over some time. Romance films evolved, by different cinematographers/filmmakers can be studied. The different genre film comparison can be done to understand the filmmaking/cinematography styles across genres.

The study could also be expanded to include a study of Romance films in all Tamil films from a specific time. The study could also be expanded to examine different filmmakers' perspectives on romantic films, as well as audience perceptions of specific filmmakers.

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UTILISING ICT TO SUPPORT BOTH CLASSROOM AND EXTRACURRICULAR LEARNING

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ABSTRACT
ICT has impacted and changed a wide range of aspects of our lives. Students and teachers may both learn in novel ways thanks to ICT in education. This prompts new worries about the "digital divide" and the availability of ICT tools and resources for those who are less well-off. ICT use in schools has a considerable positive impact on core academic subjects like reading and math. Everything is connected to ICT, ensuring speedy and accurate information delivery. In this study paper, several ICT platforms—such as Google's G Suite, social networking sites, and the flipped classroom—that are effective for studies outside of the classroom are investigated. This study article has looked at how ICT may be utilised for remote learning. Additionally, the flipped classroom, which is crucial for instructing students outside of the classroom, has been thoroughly covered. The usage of various handheld gadgets for learning outside of the classroom is then highlighted. In addition to Wikipedia, social networking sites like YouTube, Facebook, WhatsApp, Instagram, and others may be utilised for studying outside of the classroom. In the end, it can be concluded that the primary goal of adopting ICT is to get more productivity in a shorter amount of time.
Keywords: flipped classroom, Google's G Suite, Hand-held devices, social networking platform, Wikipedia

Introduction

Learning beyond the classroom refers to the use of places other than the classroom for teaching and learning. Taking classroom lessons outside can enhance a student's educational experience (Kissling, 2014). This can assist with challenging subjects and also provide perspective for them in the actual world. 60% of teachers said that their students' self-assurance, resilience, and general wellness had improved after the school visit (McDonald et al., 2013). 61% of students obtained grades that were better than expected after the visit. 67% of respondents identified cost and organisation as the key barriers to promoting more learning outside of the classroom (Rockwell et al., 1999).

Opportunities for teaching and learning outside of the classroom provide various benefits for both students and teachers. Students actively participate in experiential learning to understand the world around them (Wurdinger et al., 2009). They face real issues, form original hypotheses, test workable solutions, and form relationships with others. Many of the goals outlined above may be accomplished in college classrooms by using field trips as a tool (Windschitl, 2004). Field trips are a common component of many K–12 course curricula. Teachers must be flexible and prepared to cope with outcomes that are not favourable for their pupils (Claiborne et al., 2020).

During the course, instructors and students work with a neighbouring institution or organisation, or they go there to complete assignments with due dates (Turban et al., 2008). The class travels to a remote place for a day or perhaps just a week to focus on a certain topic or interesting endeavour (Markuset al., 2003). Certain outdoor learning activities, like geological field trips or wilderness literary hiking treks, are by nature regressive because to their length. There are several different models for study abroad programmes. In some cases, participants enrol as visiting, non-matriculated students at foreign universities (Kim et al., 2012).

Educational institutions are stepping up their attempts to go global by giving students the chance to go on short-term, faculty-led study abroad trips. There is no set rule for how much time should be spent on classroom instruction or fieldwork (Oh et al., 2021). The teachers should be prepared to apply risk management strategies while bringing students on field trips. They must know how to contact campus security, administration, the transit system, sexual assault counsellors, and nearby emergency services (Garcia et al., 2012). Students can access content that is restricted to a particular location and only available when visitors arrive at that location with the right applications (Rose David, 2000). Students can use mobile devices to create location-specific content while on a field trip or independently. The ornithology lecturer requires his students to "post" about the birds they see in their everyday surroundings (Giemza and Hoppe, 2013). Students aggregate their data while in the field, analyse it using geographic visualisation tools, and then present their findings (Vogel Bahtijar et al., 2010).

Enhancing young people's understanding, capabilities, values, and personal development can significantly boost learning and achievement. The importance of excellent education outside of the classroom cannot be overstated

(Meece et al., 2006). What we hear, taste, touch, smell, and do all give us six important "mechanisms to knowledge." Learning outside of the classroom may enhance academic performance across a range of topic areas as well as personal and social development. Since fieldwork provides direct and relevant experiences that enhance and deepen learning, every young person has a right to take part in it as part of their geography studies (Kuh et al., 2013).

Outside-the-classroom learning opportunities are a successful teaching and learning strategy. It has been shown to increase success and achievement, enhance conduct, and enhance engagement for all groups of students, even those who find it difficult to participate in class (Valls and Leonidas, 2013). How a youngster engages with an idea or subject can be greatly influenced by the "areas" in which learning takes place.

In order to be educated, one does not necessarily need to prepare for and pass college exams. In addition to academic disciplines, people also study and practise a wide range of extracurricular activities, hobbies, skill development, sports, and adventurous activities (Marks Helen, 2000). The surroundings act as their own classroom, offering both learning opportunities and obstacles. Attending adventure camps, playing sports, developing our skills and hobbies, and learning about photography, painting, music, dance, and singing are just a few of the many activities that fall under the umbrella of outdoor learning. Finally, one is given a chance by walking, working out, and gaining more mental clarity (Erwin Jonathan, 2004).

By substituting outdoor learning for traditional classroom education, students might gain an appreciation for different environments and pursuits that enhance their skills and conceptual understanding (Fauville et al., 2014). Opportunities for learning outside of the classroom are different from the traditional method. It helps students develop a range of soft skills, including leadership, teamwork, and negotiation (Vogler Jane et al., 2018). By having courses outside, teachers may make learning interesting in a real-world environment. Through outdoor classes, students are introduced to a variety of STEM careers (Beames et al., 2012).

They are very beneficial for increasing learner engagement and building self-esteem. It also assists teachers in teaching students more comprehensive learning approaches (Pellas Nikolaos, 2014). It takes the full body to learn outside, including the legs, arms, eyes, and ears. It keeps learners occupied and makes sure their brains are working properly (Doidge Norman, 2007).

The structure of this study is as follows: Section 2 addresses Technology in the classroom. Section 3 discusses at considerable length about ICT tools for learning outside of the classroom setting. This section covers the flipped classroom, Google's G Suite, mobile devices, social networking sites, and Wikipedia. Section 4 discusses distance learning using ICT. The consequences of ICT both within and outside of the classroom were then covered in Section 5. Section 6 discusses planning for data collecting, data collection, participants, resources, and methodologies. The examination of the data gathered is then discussed in Section 7. Results of the data analysis are described in Section 8. Section 9 highlights the importance of on discussions of the findings. Section 10 is designated as the conclusion.

ICT in the classroom

ICT has evolved into a crucial tool for ensuring that learners receive a comprehensive education at all times, enabling them to develop all of their digital aptitudes and abilities. Because of the speed of these technologies, we are still able to conduct online classes and post information to other educational websites while maintaining our existing pace of work (Dede Chris, 2010).

ICT integration in education refers to the use of ICT by instructors to introduce, reinforce, expand, develop, assess, and improve students' understanding of curricular objectives. Effective ICT integration in education cannot be achieved without your support as a teacher (Falloon Garry, 2020). The Australian Curriculum recognises ICT capabilities as general competencies or 21st century skills. Instructors are asked to use a range of ICT tools, approaches, and resources to support ICT-enabled teaching and learning (Bocconi et al., 2012).

If you follow these recommendations, you will be well on your way to equipping your students with 21st-century skills. Although there are several ways to integrate ICT into teaching and learning, if you want to succeed as a teacher, it's important to stick to these principles (Kivunja Charles, 2014).

Educational institutions use a range of ICT technologies for communication, information generation, transmission, storage, and management. In some circumstances, ICT is becoming important for interactions between teachers and students. Teachers must possess digital literacy and knowledge of how to integrate ICT into the curriculum. Tablets are adaptable learning tools since they can be downloaded with cheap educational

software. E-readers are electronic reading devices that have digital storage capacity for hundreds of volumes (Wood Ruth and Jean Ashfield, 2008; Sihare, 2022).

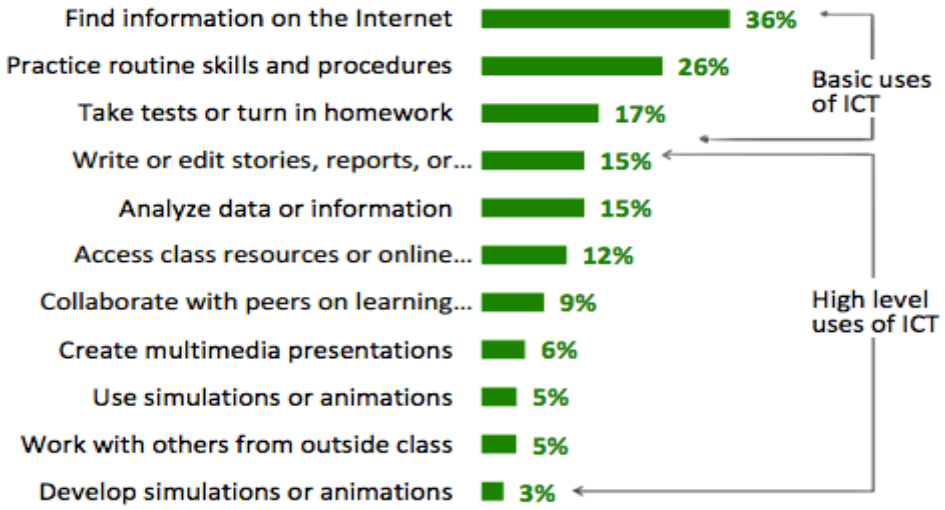

Fig. 1 Students can access ICT[1]

The flipped classroom paradigm mixes lectures and practise outside of class with in-class instruction using computer-guided education and interactive learning activities. Teacher policies must place equal emphasis on discipline-specific applications, ICT literacy abilities, and ICT use in educational contexts. According to educational institutions, all students should have equal access to ICT tools for learning. For digital content, local language and cultural development are necessary. Less minority-group pupils are likely to have home internet and computer access (Besigomwe et al., 2022).

ICT can provide a variety of options for taking in and processing information, understanding concepts, and articulating what has been learned. There are also special needs student assistance programmes available for mobile devices (Laurillard Diana, 2007).

In the classroom, computers are used to make the switch from analogue to digital. Some of your learners can start using certain ICT tools in your classroom. Once they learn how to use them, they will be able to train other students and you as the teacher (Fig. 1).

ICT Resources for learning outside classroom

Cloud computing, tablets, and virtual reality might all have an impact on education. Some professors have embraced the "flipped classroom," where pupils control their own learning at home. Mobile technologies are already taking the place of the idea that education must take place in a classroom. The exponential expansion of online distance learning is a sign of the movement away from traditional classroom-based education. While the age of individualised learning may be only getting started, the era of classroom-based education may be coming to an end (Parsons David, 2016; Sihare, 2023).

Since online distance learning has grown so dramatically in recent years, students can now acquire full degrees and work-based certificates without ever having to set foot inside a classroom. Technology may still be helpful in topics where students need to improve today (Parsons David, 2016).

i) Flipped classroom

The flipped classroom combines teaching and learning methods. By demanding that every student finish their homework outside of class and having them work on real-world issues in class, it aims to increase student engagement and learning. This educational strategy eliminates activities from the classroom that may be considered homework. In a flipped classroom, pupils engage in and assess their own learning while actively contributing to the creation and acquisition of knowledge. Problem-solving, collaboration, design, and other higher-order cognitive skills can be given additional time. In flipped classrooms, in-class activities are redesigned to offer a very diversified curriculum (Gilboy et al., 2015).

[1] https://elearningindustry.com/time-level-use-ict-in-your-classroom

Proponents assert that there is no one "right" strategy for reverse orbit. In the 1970s and 1980s, flipped learning became quite popular, which required students to master one subject before going on to another. After acquiring the requirements, students in a flipped classroom see each lecture before completing each activity or assignment (Sewell Jr and William, 1990).

Advocates claim that most students can complete a whole year's worth of work in a very short amount of time due to its efficacy. While more individualised instruction is provided for slower learners, advanced students work on their own projects. Despite the fact that some students may not have been familiar with the course material, they nonetheless demonstrated their competency on the assignments they completed (Arlin Marshall, 1984, Sihare S. R. (a), 2017).

The flipped classroom is a teaching strategy that prioritises student-centred teaching and application-based learning. The flipped classroom encourages students to understand the underlying reasoning behind the subject being provided rather than "cramming" for the test. Some contend that the flipped classroom model increases pupils' screen usage at a time when they already spend excessive amounts of time in front of devices. Preparation may take longer since producing high-quality videos requires instructors to put in a lot of time and effort outside of their typical teaching obligations. Outside of the classroom, audio pedagogy was applied through the use of videos and information slides. Software that assembled all the sources that students needed to complete their assignments outside of class was supplied in some classes (Farooque and Sadiya, 2020).

The flipped classroom is an improvement on the traditional classroom teaching method. Students are also encouraged to attend extra open lectures in order to learn more. In a flipped classroom, adaptive lessons are used to fulfil half of the pre-class preparation for the curriculum. Utilizing Smart Sparrow, a commercial adaptive platform that combines video lectures, courses, and evaluation through multiple-choice and algorithmic questions, increases the benefits. Children with disabilities might experience less stigma and have their perspectives changed with the aid of inclusive educational institutions.

Flipped learning can be implemented in regular teacher-led classes or integrated into them. Before and after each (traditional or flipped) class, anonymous assessment items on a Likert scale can be recorded (McLaughlin Jacqueline et al., 2014, Sihare S. R.(b), 2017) (Fig. 2).

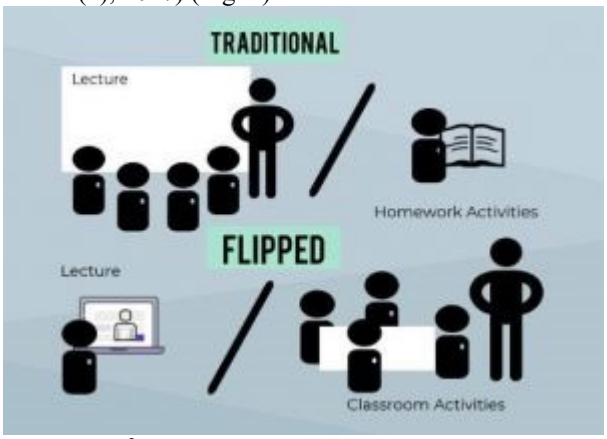

Fig. 2 Traditional vs. Flipped classroom[2]

ii) Google's G Suite

With G Suite for Education, Google intends to break down boundaries between teachers and students. The business has also produced G Suite Enterprise for Education, which contains additional capabilities targeted towards significant institutions. Subscribers also get access to one-on-one support from Google's education partners. G Suite for Education uses the same infrastructure as Gmail, and all advertisements are turned off. G Suite services, including Gmail, Google Calendar, Google Drive, and Google Sites, will be available at least 99.9% of the time (Constantinou and Elis Kakoulli, 2018).

Google servers will keep a duplicate of your information in the event that your computer is stolen or lost. Using G Suite, you can control who gets access to your data and how it is shared with them.

[2] https://teach.ufl.edu/resource-library/flipped-classroom/

G Suite for Education, a complete collection of cloud-based tools, provides collaboration, productivity, and communication tools for teaching and learning. This gives IT managers the ability to change the services provided on campus. For educational organisations like schools, the cloud provides benefits, including a simpler migration to it and tighter control over enormous amounts of data. How academic institutions cooperate, communicate, store, and access data is changing thanks to G Suite for Education. By building educational infrastructure on top of Google Cloud, schools and institutions can provide teachers, staff, and students all the tools they need to flourish in today's educational environment (Constantinou and Elis Kakoulli, 2018; Sihare, 2018).

Fig. 3 G Suite for education[3]

iii) Hand-held devices

Because handheld devices are small and lightweight, they may be stored in a pocket, handbag, or briefcase. The portable gadgets provide the one-to-one ratio required for meaningful technological innovation in education, according to the district's technology director.

The majority of third-party PDA (personal digital assistance) software is created primarily for profit. Students can carry their course materials more conveniently thanks to gadgets. The assignment is sent to the teacher's PDA using the device's infrared connection capabilities. It is "easier to use, more inexpensive, and more dependable" than a laptop (Salmon Gilly and Palitha Edirisingha, 2008).

Teachers are integrating digital advancements into the classroom. The goal is to make education more "targeted, customizable, and real-world focused." In educational institutions, devices and other tablets are becoming increasingly prevalent. Tablets and phones both have similar functions, but phones are more portable. Smart tables are reorienting information and making it more approachable for people of all ages. They can be networked together or linked to the classroom's technology infrastructure.

Students at half of American colleges and universities have access to free digital textbooks, according to estimates from digital textbook vendor Boundless. Instead of essays and self-evaluation tools, cameras are being used to generate academic material more frequently than previously. In educational institutions of all sizes, audio augmentation technology is being adopted. Wireless microphones are used to transmit the instructor's speech to speakers positioned around the classroom. Thanks to directional sound speakers, students may engage in activities from different sections of the classroom without disturbing others (Dahlstrom et al., 2013).

Options are expected to expand. The control centres for the teachers help the high-tech classrooms run smoothly. Even though technology is revolutionising the industry, many educational institutions still struggle to invest in brand-new, cutting-edge facilities due to budgetary restrictions. On the practicality and appropriate implementation of networked learning environments, many experts differ (Fig. 4).

[3] https://blog.tcea.org/g-suite-edu-questions/

Fig. 4 Various handheld educational tools used outside of the classroom[4]

iv) Social networking platforms

We believe social media has the power to simplify almost everything. There are several ways that social media may be utilised for education, from announcing e-learning to conducting live lectures. Teachers can communicate with students in Facebook groups while keeping a professional distance. Students can create their own Instagram profiles to convey digital content in an aesthetically pleasing manner. Teachers may use Twitter as a discussion board or platform for their courses (Lomicka Lara and Gillian Lord, 2016).

Pinterest is a fantastic social media platform where teachers can organise their lesson ideas and worksheets for their students. Students may also use it to create a digital bibliography for their essays, group projects, and research assignments. Higher education marketing makes extensive use of social media. Putting special occasions and extracurricular activities on display might set your school apart from the competitors. Making Facebook groups for current and former students might promote a sense of belonging and school spirit. The use of social media management tools can guarantee that material is posted to each of your school's social media networks (Fig. 5) (Lea et al., 2011).

Teachers use Skype to speak with their students as well as to connect them with "pen pals" who are spread out across the globe. Today, Skype may also be used for larger group projects, such as partnering students who are interested in the same subject. Teachers may use Facebook to get their students involved in active learning. When creating study boards and organising resources, teachers and students can both benefit from utilising Pinterest. As a history class project, you might give students the assignment of choosing the most spectacular historical buildings or monuments in their city, compiling information about them, and organising it on a Pinterest board. LinkedIn is now the most well-liked business network and may be used in the classroom. Students can practise utilising social media for teaching by using Flickr and Instagram. On LinkedIn, there are many companies, including colleges and universities, as well as several official organisations for certain niche markets like colleges, degree programmes, etc. (Lea et al., 2011).

Through social media, parents, teachers, and students may all immediately connect. If used effectively, social media might enhance the learning experience for every student in the classroom. It is vital to comprehend how social media impacts education before integrating it into the classroom.

[4] https://firstmonday.org/ojs/index.php/fm/article/view/3932/3643

At first glance, incorporating YouTube in the classroom could seem like a challenging task. To help professors and students make the most of "essential" websites, we have put together a few recommendations. A 2014 Ofcom poll found that "one in three children had a tablet at home," increasing the chance of giving them "video" homework.

YouTube's features encourage the usage of instructional videos because it's simple to upload and share new content. Unofficial educational videos on YouTube have become essential to students' learning. The demand for new learning platforms is underscored by the popularity of YouTube channels and videos from non-institutional sources. In instructional movies, common people have occasionally portrayed themselves as specialists (Duffy Peter, 2008).

Fig. 5 Various social media platforms are utilised to educate people outside of traditional classrooms[5]

YouTube is becoming a resource for information about subjects related to science, technology, and medicine. Whether watching movies may alter viewers' attitudes, behaviours, or knowledge has been the subject of studies. Studies show that instructional movies are more effective for learning than other resources like books or the internet. evaluated the clarity, quality, and content commitment of medical textbooks, e-medicine, and YouTube videos as they related to the cardiovascular system. E-learning tools or multimedia presentations help students learn more when compared to traditional teaching methods ((Duffy Peter, 2008)).

v) Wikipedia

Wikipedia is the world's largest online encyclopaedia. In our opinion, Wikipedia represents a well-developed digital cultural system. We claim that learning happens as a "side effect" of this virtual acculturation process. It is feasible to argue that an educational organisation should be allowed access to the online community's virtual space. Students and teachers must leave their "comfort zones" and the enclosed physical space of the classroom in order to encounter a foreign cultural environment.

Outside of the classroom, which is a "protected," walled-off, and culturally recognised area, this acculturation process takes place. The educational benefits are determined by the challenging application process to join the Wikipedia online community. Virtual acculturation occurs in environments with real social interactions and peer-to-peer editing transactions. It occasionally has the impression of being an "aggressive" or "unfriendly" atmosphere, full of virtual threats like cybertrolls, flamethrowers, edit battles, etc. (Guillén et al., 2020).

New users can quickly communicate with other community members because of Wikipedia. The technologies that are available have a direct impact on how people behave, and education is always ingrained in the cultural milieu of a knowledge community. Even the most sophisticated ITS cannot solve the inherent complexity of a networked human (Intelligent Tutoring System). Learning, acculturation, and acculturation are all interrelated

[5] https://medium.com/@braydenfox/social-media-and-education-using-social-media-for-better-academic-results-804b7a41a825

ideas. Community learning is being used more and more in online environments. The Wikipedia community exhibits the traits of a professional community. The expression alludes to two related characteristics: something that a group of individuals has in common and something that distinguishes them considerably from other groups to which they are seen to belong (Jonassen David and Lucia Rohrer-Murphy, 1999).

Distance Learning Using ICT

Education is the most important investment that societies, families, countries, and individuals can make for the future. In the twenty-first century, the use of information technology has multiplied. Effective ICT integration into the educational system is a challenging, comprehensive process that includes not just technology but also curriculum and pedagogy. Information and communication technology (ICT) is referred to as a "diverse set of technical tools and resources used to communicate, as well as generate, transfer, store, and manage information." ICT includes a wide range of devices like computers, the Internet, radio, television, and telephones. Networked PCs and the Internet are the ICTs that facilitate interactive and collaborative learning the best. A new era of distance learning has so far been ushered in by the use of voicemail, email, teleconferencing, and computer-based integrated telephony and multimedia technologies. A single teaching method may not be the most effective for all learning needs, and every technology has benefits and drawbacks of its own. Selecting the best medium for a learning package is a challenging decision that is influenced by a number of elements, including the specific learning objectives of the unit (Kirkup Gill and Adrian Kirkwood, 2005).

The primary objective of providing distance education courses is to keep students from feeling disconnected from their studies. Electronic media includes, among other things, radio, television, computers, and the Internet. Libraries, educational institutions, and hospitals are just a few of the sectors where ICT usage has increased dramatically over time. Information and communication technology (ICT) is vital in distance learning to meet the wide range of student expectations. ICT uses a range of devices and software that may be adjusted to the demands of students at various academic levels and in a wide range of contexts. This has made information accessible and usable from anywhere at any time.

Impact ICT outside and inside of the classroom

Computers may be used in educational settings and computer literacy programmes for good reasons. You can think of customers, hardware, electronic resources, and implementation while analysing the demand for infrastructure. The selection and distribution of hardware and software are key factors in how well computers are used in classrooms. Teachers may need to be involved and ready since certain software programmes are simpler to integrate into the curriculum than others. It is essential that pupils have sufficient access to the required tools (Cuban et al., 2001).

High-end computers must be available to teachers and students around the clock, no matter where they are. Most programmes require students to have immediate access to a computer. Purchasing enough computers could be difficult due to their high cost. Equipment that is not fit for the needs of the students is routinely purchased by educational institutions. The volatility of the technology reduces the usefulness of using computers as a work completion facility (Cuban et al., 2001).

Methods and Materials

Planning of data collection

To find out how often people use electronic devices outside of the classroom for learning, a survey was undertaken. Information was gathered from the specified students for this investigation. The majority of students were initially invited, however some students did not answer or took a long time to react and were not considered in the survey. Students from all levels scored similarly on the survey. Students from all academic disciplines, including the arts, business, science, medicine, engineering, polytechnics, etc., have been given equal weight. Equal numbers of male and female students took part in this survey. The identical kind of inquiry was addressed of both male and female students.

We created a qualitative questionnaire before gathering the student's data. The questionnaire wasn't sent to all the students until it had been examined two or three times. We discovered that the questionnaire was missing some important information after distributing it to the students. As a result, following the distribution of the questionnaire, each student received a subseries of follow-up questions. Our proposal was soon answered by some students. Despite some students taking longer than anticipated to answer, we nevertheless got all the survey results we needed from the required students.

Although we made an effort, the information provided by the questionnaire about students' usage of electronic devices for reading outside of the classroom was insufficient. As a result, we experimented with other

techniques, like meeting students in person and addressing the problem. This was explained to the students before the address. Furthermore, we only selected students who had prior exposure to it. They had no trouble answering the question because they had received the questionnaire in advance.

Questions were asked of the students up till the study's objective was accomplished. During the verbal discussion, student strength was also taken into account. There were many students at certain colleges while there were few at others. There were many of students studying business and the arts, but not as many pursuing engineering or becoming dentists. The sample set was created with the amount of college students in mind.

Before beginning any of the aforementioned work and only after information had been gathered for this study through a variety of media, students were also invited. Just a handful of the various formats that interactions may take include email, verbal contact, and social networking. We employed all of these mediums, as well as technology, to obtain information more quickly. We used electronic media to the fullest extent possible since it was simple to get and assess information.

They were informed of the reason for information gathering prior to the verbal data collection so they could be completely honest with us. The study-related questions that were fact-related were only posed once all of their inquiries had been answered.

Data collection and participants

Data collection for this study took place in November and December 2022. We invited the target students to participate in this study, as was previously mentioned. The majority of students agreed to participate in the survey. But we only chose students who were previously familiar with our research. To determine how many students would use electronic devices for study outside of the classroom and draw the appropriate conclusions as a result, we chose students from various levels. The sample size was maintained at a suitable level in order to ensure the correctness of the data that was gathered. The students were separated into groups for convenience's sake so that the data could be gathered effectively. Each group consisted of ten students and was given a distinct set of questions. To better comprehend the students' individual issues and other difficulties, verbal interaction was had with them. Understanding the issues facing students is crucial in order to comprehend the justifications for the proposed research. Despite several sections being left blank, the majority of students answered the questionnaire.

Table 1. Participants' overall invitation, response, and participation rate

	Invitation		Participates		Male invitation and participation		Female invitation and participation	
	Male	Female	Male	Female	Mean	SD	Mean	SD
Primary	340	470	321	456	661	13.44	463	9.90
Secondary	390	380	354	300	744	25.46	340	56.57
Higher Secondary	400	450	356	378	756	31.11	414	50.91
Undergraduate	650	600	568	457	1218	57.98	528.5	101.12
Postgraduate	400	400	213	245	613	132.23	322.5	109.60

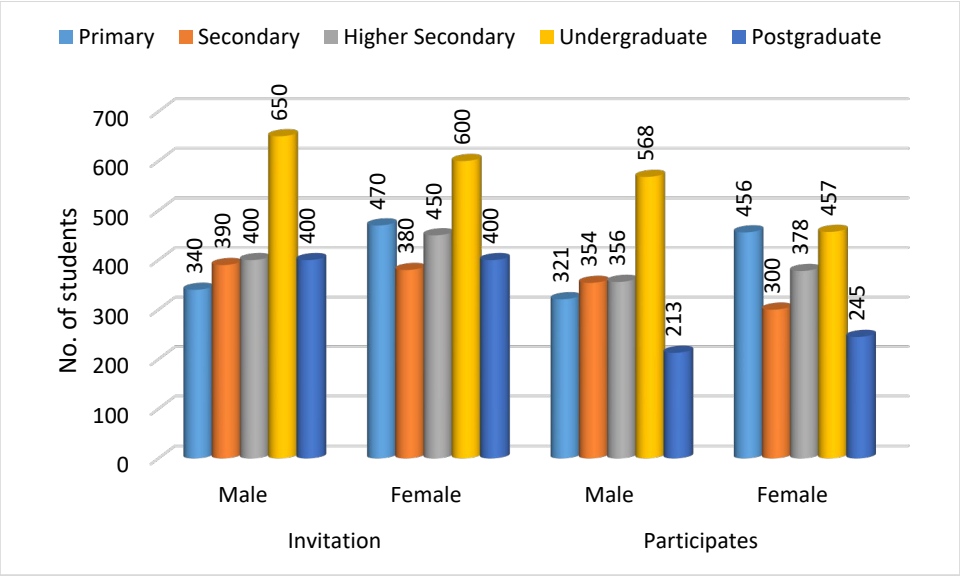

Fig. 1 Graphical representation of Table 1 collected data

Table 2 The use of the Internet by students for academic purposes outside of the classroom

	strongly agree		agree		neutral		disagree		strongly
	Male%	Female%	Male%	Female%	Male%	Female%	Male%	Female%	Male%
Primary	47.35	48.25	38.94	38.38	10.9	10.31	1.87	1.75	0.93
Secondary	49.72	49.33	41.81	42.33	5.93	6.33	1.41	1.33	1.13
Higher Secondary	51.97	52.38	41.57	38.89	4.49	6.08	1.12	1.59	0.84
Undergraduate	53.35	49.23	39.26	43.33	4.75	5.25	1.41	1.31	1.23
Postgraduate	58.69	75.92	30.99	19.59	7.04	3.27	1.88	0.82	1.41

Table 3 Students using the internet for educational purposes outside of the classroom

	Primary%	Secondary%	Higher Secondary%	Undergraduate%	Postgraduate%
Internet accessibility for students at home	60	70	65	85	95
Daily Internet use in %	95	78	46	53	67
Playing cooperative or single-player online games on a computer	50	68	60	40	34
Taking part in social networking	20	75	78	65	50
Internet conversation	30	54	80	71	45
Average life happiness as measured by online activity after school/college	80	64	40	28	30
Use of Internet throughout the weekends	85	78	62	68	56

Table 4 Attitudes of students when the internet is unavailable or malfunctions in the classroom

	Primary		Secondary		Higher Secondary		Undergraduate		Postgr
	agree%	disagree%	agree%	disagree%	agree%	disagree%	agree%	disagree%	agree%
Obtaining information from the Internet, by socio-economic status	90	10	84	16	78	22	71	29	64
Feeling bad if not connected to the Internet, by gender	95	5	86	14	84	16	87	13	78

Table 5 Using the Internet weekly in the classroom to boost student academic achievement in science

	Primary%	Secondary%	Higher Secondary%	Undergraduate%	Postgraduate%
Utilizing the Internet in institute to scale one's understanding of science	10	17	13	38	47
Low Internet users	6	8	5	6	6
Moderate Internet speed users	57	68	71	75	63
High Internet speed users	41	57	59	56	45
Extreme Internet speed users	9	10	12	18	25

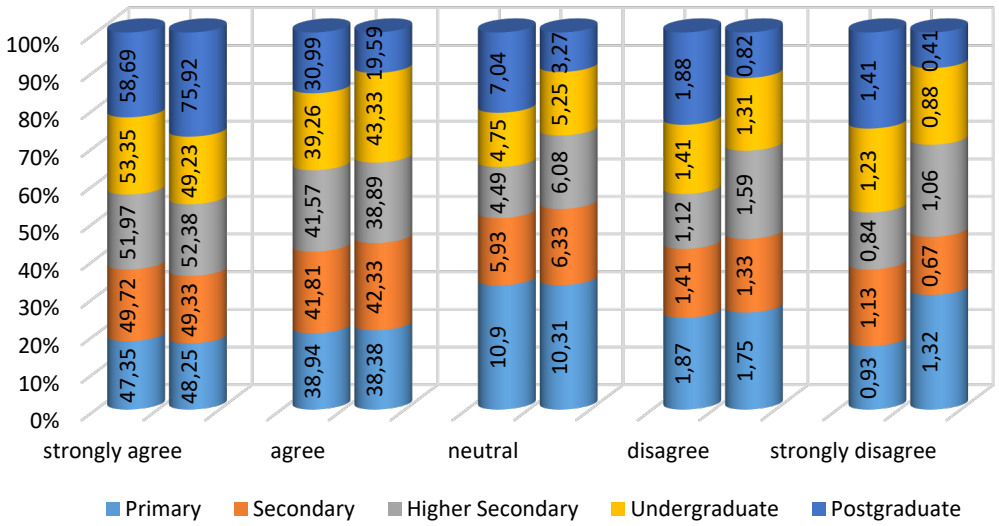

Fig. 3 Table 2's visualization methods demonstrate whether students utilize the Internet for academic reasons outside of the classroom.

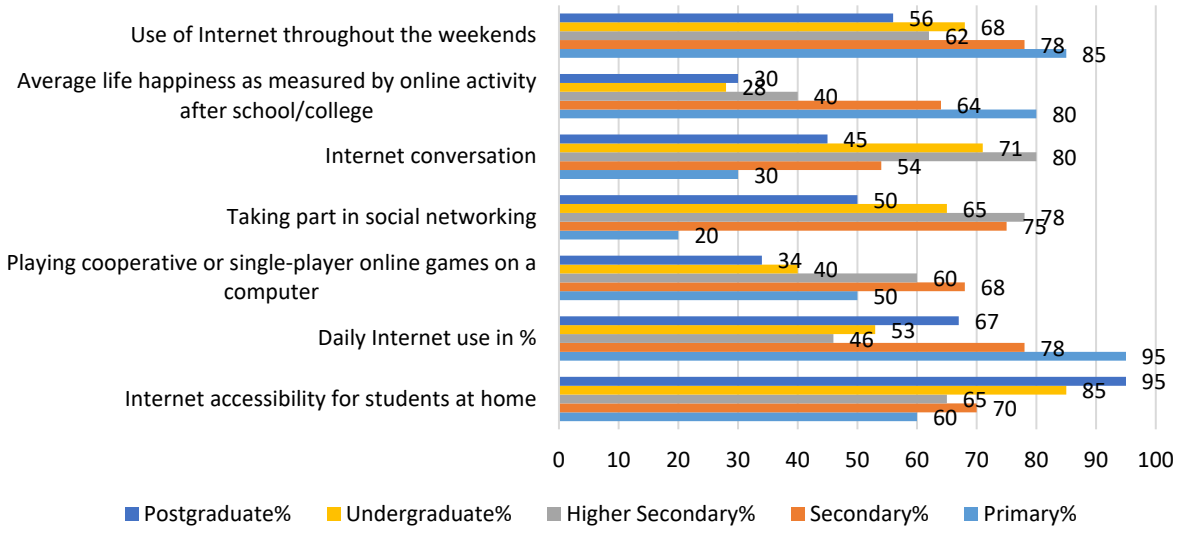

Fig. 4 Students' views are depicted graphically in Table 3 for data on how they feel when the internet is unavailable or malfunctioning outside of the classroom

Materials and Methods

An exploratory interview study served as the foundation for the questionnaire design. To particularly target the student population at the various educational levels involved in this research, several versions of the questionnaire were developed. In this section, we concentrated on the questionnaire's components that were developed especially for the students. The questionnaire was interactive, and based on a participant's responses to earlier questions, occasionally, new questions would be asked. As a result, some participants provided different or less information than others. Depending on the question, different percentages of people participated overall.

The following are the three main categories into which study questions may be separated. Next, we'll go through the questions on which they were based, the potential responses, and the steps we took to develop the metrics that were employed in the study.

1) *Information about your demographics.* Age, gender identification, and the name of the educational institution are examples of basic demographic questions.
2) *Social and personal issues.* The research made an effort to evaluate the students' personal and societal problems in considerable detail. We encouraged them to use words like "strongly agree," "agree," "neutral," "disagree," and "strongly disagree" in their responses so order to preserve their identities. Others selected "neutral," "disagree," or "definitely disagree," while several students selected to agree or strongly agree. Participants were only given questions specific to those elements if they had previously stated in the questionnaire that their challenges at the higher education level contained these characteristics.
3) *Participation.* We answered several of the student's queries inadvertently by avoiding direct communication. We asked this question personally rather than in public in order to safeguard the privacy of the students. This made it feasible for the student to respond truthfully and for our study to be as precise as possible. Many students were reluctant to provide answers to direct questions. He was reluctant to provide any personal information. We did not compel any student to respond. The student has the choice of responding to the questions or moving on to another set if he so chooses.

Data Analysis

Demographic data, social and personal issues, and the majority of the participation questionnaire's multidimensional questions comprised the Materials and Methods section. The participants, however, only received one-dimensional responses. The majority of the questionnaire's questions received responses from the participants.

Findings

Students from various levels at the institution responded to the surveys. This part evaluated the data gathered in relation to using technology outside or/and inside of the classroom for learning. In order to get at a firm conclusion, the recorded data were first subjected to make comparative analysis. Separate investigations and comparison studies with regard to the usage of electronic devices by the students for study purposes were carried

out in order to ensure accuracy, transparency, and confidence in the findings.

When questioned about using the internet for academic purposes, the majority of elementary, secondary, upper secondary, undergraduate, and postgraduate students said that they do so outside of class. The study discovered that primary and secondary students use the Internet for academic work outside of the classroom more frequently than other students. Compared to younger students, undergraduate and graduate students are less likely to conduct academic work outside of the classroom. The survey also revealed that students of all academic levels strongly support and agree with the use of the Internet for academic purposes outside of the classroom (Fig. 3 and Table 4).

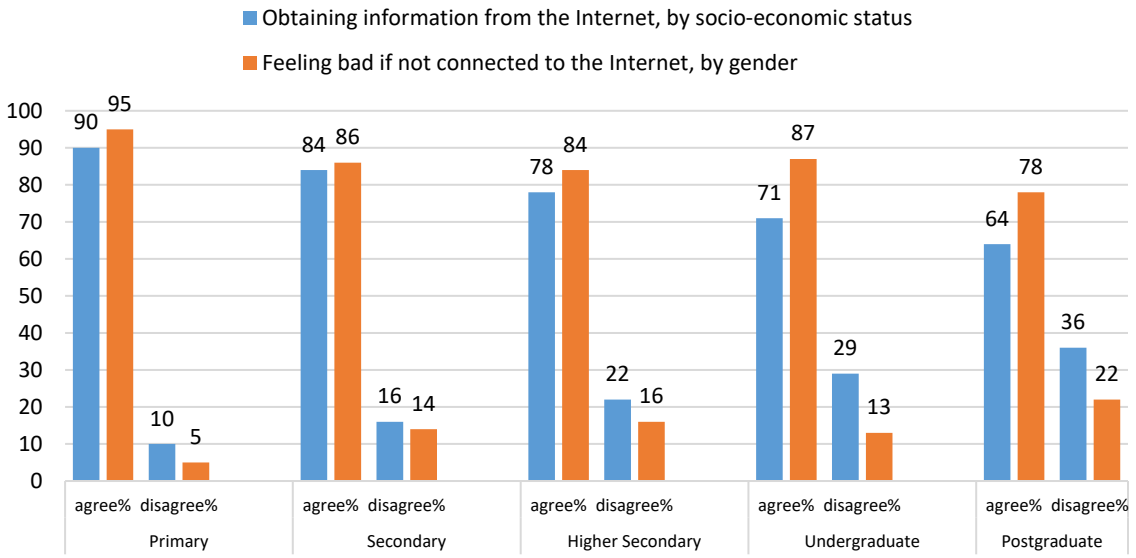

Fig. 5 Predictive analytics for Internet use by students for educational purposes outside of the classroom is shown in Table 3

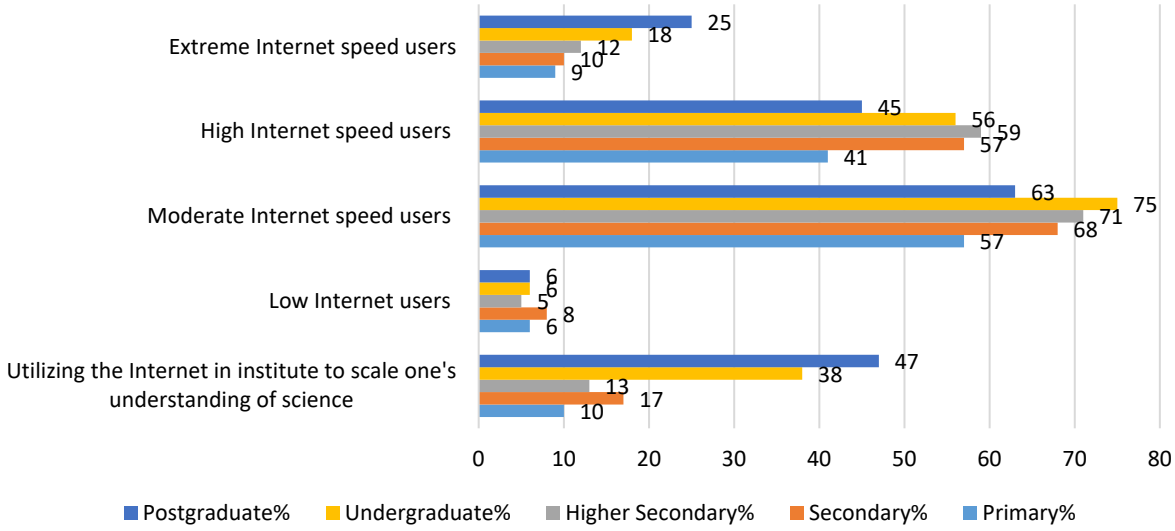

Fig. 6 Weekly internet usage in the classroom to improve scientific performance, visual analytics, Table 5. Data distribution in graphical form for Internet use by students for academic purposes both within and outside of the classroom

Fig. 4 illustrates how more postgraduate and undergraduate students than other students utilize the Internet on the weekends to do their academic work. In comparison to students at lower levels, undergraduate and graduate students are happier with online activities because they experiment with entertainment and have a deeper understanding of the game's complexities. Little children merely play online games for fun. The major reason why undergraduate and high school students utilize social networking sites more than other students are because their group circle is substantially broader. Also, young children do not view conversation as entertaining and, as a result, do not show much interest in it, but older students engage in meaningful conversation since they are more aware of right and wrong, which is tied to academics. Since they desire to use the Internet primarily for

amusement purposes exclusively, secondary and senior secondary students are more likely to have a liking for playing online games. Also, younger students use the internet at home less than other older students do since they are under more pressure to study from their parents. Undergraduate and graduate students use the internet more at home for academic work since there are fewer limitations from their parents (Table 3).

The predictive study of students using the Internet for academic study outside of the classroom is shown in Fig. 5 (Table 3). According to the survey, students of all grade levels were willing to utilize the Internet to learn more about their socioeconomic standing. Only a few students indicated their mobile internet access had been impacted when students of all levels were asked if it had. The majority of students chose "agree" or "disagree" equally when responding to this question. In other words, we can state that the majority of students receive twenty-four-hour service without interruption from internet access. Fig. 6 (Table 5) displays the responses to inquiries about internet speed using a bar chart. In our study, we discovered that the majority of students had mobile internet at a modest speed.

Discussion of the Results

We looked at a variety of academic works that were pertinent to this inquiry. After careful analysis, it was found that the advent of computers led to a considerable shift in society's functioning in addition to technological advancements. Man is viewed as a social animal that serves the community throughout his life. However, their way of life has undergone significant change since the development of computers and related technologies. The urge for people to use technology more frequently is having an impact on their mental health and contributing to an increase in mental diseases. Both the teaching and learning of many disciplines as well as the educational field may be significantly impacted.

The usage of technology gadgets has led to a rise in mental stress, which has a direct impact on academic achievement. In other words, mental tension has a subtle negative impact on reading that results in a loss of interest. The number of student dropouts has significantly grown in recent years. The COVID-19 epidemic and online learning, among other things, are mostly to blame for this.

Conclusion

ICT integration in education is the use of ICT by teachers to begin, reinforce, extend, develop, assess, and enhance students' knowledge of learning objectives. The notion that education should take place in or outside of the classroom is already being replaced by mobile technology. The "flipped classroom," in which students manage their own learning from home, has been adopted by certain academics. Virtual reality, iPads, and cloud computing may all affect education. A teaching method known as the "flipped classroom" puts an emphasis on teaching that is student-cantered and application-based learning. Due of its success, proponents assert that the majority of students can do a full year's worth of work in a short period of time. Some claim that since students already spend too much time in front of screens, this will increase their usage.

Google hopes to eliminate barriers between instructors and students with G Suite for Education. Students can also get individualised assistance from Google's education partners. Making education more "targeted, adaptable, and real world centred" is the aim. More often than ever, cameras are being utilised to create academic material. Social media may be used effectively by both teachers and students in the classroom. According to Ofcom[6], "one in three youngsters" had tablets at home, which increased the likelihood that they would get "video-homework" for GCSE topics.

Learning happens as a "side benefit" of this virtual acculturation process on Wikipedia, which is a digital cultural system. One may argue that an educational institution ought to have access to an online community's virtual area. A difficult application procedure to join the Wikipedia online community determines benefits. "A broad collection of technological tools and resources used to communicate as well as to produce, transport, store, and manage information," is how ICT is described. A wide number of devices are included in ICT, including computers, the internet, radio, television, and telephone.

Declaration

Conflict of interest They further declare that they have no conflict of interest.

Data availability The authors confirm that the data supporting the findings of this study are available within the article

[6] https://www.ofcom.org.uk/research-and-data/media-literacy-research/childrens/children-parents-oct-14

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