

DIGITAL TRANSFORMATION IN HIGHER EDUCATION IN POST COVID-19 AND ITS IMPACT ON WOMAN EDUCATION – A CASE STUDY ON THE WOMAN STUDENTS OF GOVERNMENT ARTS & SCIENCE COLLEGES IN CHENNAI

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Abstract- Advancements in information technology have been transforming the communication practices and learning aspects of students. Digital Learning in India is the way forward to learning and gaining knowledge through the means of technology and digital tools and devices. The post Covid-19 pandemic has forced the students to adopt digital learning along with conventional learning and offers the teachers an opportunity to improve the digital teaching experience and to improve the quality of digital learning for students. The present study is conducted to identify and examine the factors that contributing digital learning for higher education and the impact of digital learning on the academic performance of woman students studying in select Government Colleges in Chennai district.

The study is exploratory and descriptive in nature. By adopting Convenience Sampling method, the primary data was collected through questionnaire from 120 Woman students of Government Arts and Science Colleges who are using digital learning tools and applications for their higher education during post Covid-19 period in Chennai district. The researcher applied descriptive and inferential statistical tools for data analysis. The research reveals that Post-graduation students have more perception on the various aspects of Digital Learning tools/applications and have perceived more academic performance than the Under-Graduate Students. The study found that out of four aspects/factors that contributing Digital Learning for higher education, "Convenient in Learning" factor has more impact/influence on Academic Performance of woman students than others. The study suggests that the Digital Learning Service Providers, Digitech and Learn-tech companies and Learning App Developers should formulate, amend and implement appropriate policy decisions and strategies relating to design and development of digital learning apps/tools in such a manner that would improve and enhance the learning and academic performance of the woman students. It is also suggested that the Government along with other related stakeholders should take initiatives to enhance digital infrastructure and improve the digital learning environment of the students.

Keywords: Digital Learning, Higher Education, Quality of Learning Content, Convenient, Benefits, Covid-19 Pandemic, Academic Performance.

INTRODUCTION

The fourth industrial revolution, known as the 'digital revolution', characterized by a fusion of technologies in economic, social, and human environments and play an effective role during and after Covid-19 pandemic. Advancements in information technology have been transforming the communication practices and learning aspects of students. Digital Learning in India is the way forward to learning and gaining knowledge through the means of technology and digital tools and devices. The post Covid-19 pandemic has forced the students to adopt digital learning along with conventional learning and offers the teachers an opportunity to improve the digital teaching experience and to improve the quality of digital learning for students. The present study is conducted to identify and examine the factors that contributing digital learning for higher education and the impact of digital learning on the academic performance of woman students studying in select Government Colleges in Chennai district.

LITERATURE REVIEW AND RESEARCH GAP

Hiyam Abdulrahim and Fatma Mabrouk (2020) carried out a study to examine the effectiveness of the digital transformation in higher education and found that digital learning is distinct compared to traditional learning, it improves the student's learning outcome, enhance the faculty member's capabilities and implementation of technical systems, develops staff productivity and work environment. **Burns et al. (2020)** in their study pointed out that online/digital education was confusing because it had to be abruptly switched to and education did not go as planned. However, in addition to identifying some problems, the exploration of possible solutions is also an important result of previous research. **Huyen Pham et al. (2021)** in their study analysed the factors affecting the readiness of Vietnamese students for digital transformation. The study is based on TAM model and primary data were collected from and finalized from 913 students. The study with the application of Structural Equation Model, analysed the Self- study ability,

Attitude, Perceived Usefulness, Perceived Ease of Use, and Covid-19. The study found the relationship between the independent (Usefulness, Perceived Ease of Use, and Covid-19) and dependent variable i.e., Readiness for digital transformation.

Victor Garcia Morales, et al. (2021) in their study focused on the field of education to show how higher education institutions are undergoing radical transformations driven by the need to digitalize education and training processes in record time with academics who lack innate technological capabilities for online teaching. Based, on the literature review, the study concluded that the university system must strive to overcome this situation to be competitive and provide high-quality education in a scenario of digital transformation, disruptive technological innovations, and accelerated change. **Dora Horvath, et al. (2022)** studied how students perceive the differences between online and offline education, we investigated the perceived advantages and disadvantages of online-only education, how this influenced their social networks, study efficiency and their whole experience in university education.

The impact of the Covid-19 pandemic on students has been addressed in several studies over the past years and they have discussed about the impact of digital education on students' performance. However, there is no previous study conducted that analysing the impact of digital transformation in higher education during post covid-19 and particularly the impact on woman students of Government Arts and Science Colleges in Chennai. This study is expected to bridge the gap found in the research and provide useful contribution to policy makers and researchers of the similar nature of study.

STATEMENT OF PROBLEM

Digital technologies are mitigating the effect of Covid-19 pandemic on higher education through adopting digital teaching and learning and acts as substitutes for traditional learning system in India. All the educational institutions including colleges and universities are providing educational services through digital technologies and technological work systems during the COVID-19 pandemic. The digital transformation which different from traditional teaching methods, must provide good learning outcome for students, enhance the faculty member's capabilities in teaching, improve the productivity of faculty members in administrative tasks, and should create an efficient work environment for teachers and conducive learning environment for students. The role of woman's participation in employment is important in India. Women education in India plays a very important role in the overall development of the country. It not only helps in the development of half of the human resources but also in improving the quality of life at home and outside.

Understanding and analyzing the perception of the woman students with respect to digital education and impact of digital transformation in higher education during post covid-19 and particularly the impact on woman students of Government Arts and Science Colleges in Chennai district is of interest for both policy makers and researchers. Therefore, this study is carried out to analyse the women's perception on the various aspects of Digital Learning tools/applications and their impact on academic performance of woman students of Government Arts and Science Colleges in Chennai district.

OBJECTIVES OF THE STUDY

The present study is conducted with the following objectives:

1. To study the Learning Profile of the woman students studying in Government Arts and Science Colleges in Chennai.
2. To analyse the perception of woman students on the various factors that contributing digital learning for higher education in Chennai.
3. To examine the impact of digital learning on Academic Performance of the woman students studying in Government Arts and Science Colleges in Chennai.
4. To examine the relationship between Perception on the various factors that contributing digital learning and Academic Performance of woman students studying in Government Arts and Science Colleges in Chennai.

RESEARCH METHODOLOGY

By adopting Convenience Sampling method, the primary data was collected through questionnaire from 120 Woman students of Government Arts and Science Colleges who are using digital learning tools and applications for their higher education during post Covid-19 period in Chennai district. The researcher applied descriptive and inferential statistical tools for data analysis. The research applied the combination of exploratory and descriptive research design. Mixed research approach (both qualitative and quantitative) was adopted in this study. The researcher used Convenience Sampling method, a type of non-probability sampling technique since the information about the exact population and sampling frame of the woman students who are using digital technology in higher education (Government Arts and Science Colleges) in Chennai district.

The primary data (based mostly on primary source) was collected through questionnaire from 120 Woman students studying in Government Arts and Science Colleges in Chennai district. The researcher applied descriptive (percentage and Mean Analysis) and inferential statistical tools (independent sample 't' test, One-way ANOVA, Correlation and Multiple Regression) for data analysis. The hypotheses were formulated and tested with the above inferential statistical tools and proper inferences were presented.

DATA ANALYSIS AND RESULTS

1. DEMOGRAPHIC PROFILE OF THE WOMAN STUDENTS

Table 1
DEMOGRAPHIC PROFILE OF THE WOMAN STUDENTS
(Sample Size = 120)

VARIABLES	OPTIONS	FREQUENCIES	(%)
Present Education	Under-Graduation	84	70.00
	Post-Graduation	36	30.00
First Graduate in the family	Yes	73	60.83
	No	47	39.17
Monthly Family Income	Upto Rs.50,000	62	51.67
	Rs.50,001 – Rs.1,00,000	35	29.17
	Above Rs.1,00,000	23	19.16
Size of Family	Small (1 to 3 members)	71	59.17
	Medium (4 to 5 members)	30	25.00
	Large (More than 5 members)	19	15.83

Source: Primary Data

From the above table 1, it is inferred that Under-graduate woman students (84, 70%) are more than post-graduate woman students (36, 30%) and more than 60% (73) of the woman students are first graduates in their family. 51.67% (62) of them come under the monthly family income up-to Rs.50,000. 59% (71) of the woman students belong to small family with 1 – 3 members.

2. LEARNING PROFILE OF THE WOMAN STUDENTS

Table 2
LEARNING PROFILE OF THE WOMAN STUDENTS

VARIABLES	OPTIONS	FREQUENCIES	(%)
Domain of the Study	Arts	52	43.33
	Science	35	29.17
	Commerce/Management	33	27.50
Type of digital learning tool/App for education you used mostly (MULTIPLE CHOICE)	Video Meeting Apps (Google Meet, Classroom Zoom, etc.)	120	100.00
	Government Learning Apps (Swayam, Diksha, NPTEL, E-PG Pathshala, etc.)	69	57.50
	Private Learning Apps (Udemy, Unacademy, Vedantu, UpGrad, etc.)	52	43.33
	General Online learning apps (YouTube, Trivia maker, Google Sites, Quizizz, etc.)	96	80.00
	Others	36	30.00
Purpose of using digital learning tools/apps (MULTIPLE CHOICE)	Online learning	102	85.00
	Sharing online study materials, assignments, etc.	36	30.00
	Knowledge development (Understanding /Broadening / Updating / Sharpening, etc.)	84	70.00
	Language Development	38	31.67
	Development of Job/Business Skills	55	45.83
	Value Addition/Getting Certificate	80	66.67
	To succeed in Competition Exam	28	23.33
Access of digital learning tools / apps	Laptop	40	33.33
	Mobile Phone/Tab	62	51.67
	Desktop Computer	18	15.00

Source: Primary Data

From the above table 2, it is inferred that 43.33% of the woman students belong to Arts domain. Video Meeting Apps (Google Meet, Classroom Zoom, etc.) and General Online learning apps (YouTube, Trivia maker, Google Sites, Quizizz, etc.) are the mostly used types of digital learning tool/App for education. Online learning, Knowledge Development and Value Addition/Getting

Certificate are top three purposes of woman students for using digital learning tools/Apps. 51.67% (62) of woman students are accessing the digital learning tool/App for education through their mobile phone/tab.

3. FACTORS THAT CONTRIBUTING DIGITAL LEARNING FOR HIGHER EDUCATION

The table 3 provides the information relating to the woman students' Perception on the various factors that contributing/influencing Digital Learning for higher education in Chennai district. For this purpose, 12 Questions relating to the four factors i.e., Quality of Learning Content, Convenient in Learning/Usage, Benefits available and Covid-19 Pandemic (3 Questions/variables for each factor) with five-point Likert scale (Strongly Disagree to Strongly Agree) were asked through the pre-planned questionnaire from the woman students studying in Government Arts and Science Colleges in Chennai district.

Table 3
FACTORS THAT CONTRIBUTING DIGITAL LEARNING FOR HIGHER EDUCATION

VARIABLES	N	MEAN	SD
Quality of Learning Content	120	11.67	3.254
Convenient in Learning/Usage	120	13.55	2.687
Benefits available	120	10.32	4.336
Covid-19 Pandemic	120	11.29	3.984
FACTORS THAT CONTRIBUTING DIGITAL LEARNING FOR HIGHER EDUCATION	120	46.83	6.841

Source: Primary Data

From the above table 3, based on the mean score of the Factors that contributing Digital Learning for Higher Education, it is inferred that Woman students have more perception (out of the four factors) on 'Convenient in Learning/Usage' (M = 13.55) and have lesser perception on 'Benefits available' (M = 10.32) than other factors. It is also inferred that the Woman students' perception on the various the Factors that contributing Digital Learning for Higher Education is above the average level since the all the Mean values are above 10 out of 15 (more than 66.67% or one-third). The Overall Mean Score of the Woman Students' Perception on the various Factors that contributing Digital Learning for Higher Education is 46.83 which is 78.05% (46.83 / 60 x 100). This pointed out that the Woman Students' Perception on the various Factors that contributing Digital Learning for Higher Education is above 78% which is above the average level.

INFERENCE STATISTICAL ANALYSIS

H₀: There is no significant difference between Under-Graduate and Post-Graduate Woman Students with respect to the Perception on the various Factors that contributing Digital Learning for Higher Education.

An independent-samples t-test was conducted to compare the difference between Under-Graduate and Post-Graduate Woman Students with respect to the Perception on the various Factors that contributing Digital Learning for Higher Education. As the P value (0.000) is lesser than Sig. Value (0.01), the Null Hypothesis is rejected.

Table 4
TYPE OF STUDENT - PERCEPTION ON THE FACTORS THAT CONTRIBUTING DIGITAL LEARNING FOR HIGHER EDUCATION

VARIABLE	TYPE OF STUDENT						t - value	p - value
	Under-Graduation			Post-Graduation				
	N	Mean	SD	N	Mean	SD		
Perception on the factors that contributing Digital Learning for Higher Education	84	40.15	6.787	36	45.28	5.692	8.654	0.000**

Source: Primary Data (** 1% level of Significance)

Based on the mean score of Woman Students' Perception on the Factors that contributing Digital Learning for Higher Education, we can say that the mean value of Post-Graduate woman students (M = 45.28) is more than Under-graduate woman students (M = 40.15). This also indicates that the Post-graduate woman students have perceived more on the various Factors that contributing Digital Learning for Higher Education than Under-graduate woman students. Hence, it is concluded that there is statistically significant difference between Under-Graduate and Post-Graduate Woman Students with respect to the Perception on the various Factors that contributing Digital Learning for Higher Education.

4. IMPACT OF DIGITAL LEARNING ON ACADEMIC PERFORMANCE

H₀: There is no significant difference between Under-Graduate and Post-Graduate Woman Students with respect to the Impact of Digital Learning on Academic Performance of woman students of higher education.

An independent-samples t-test was conducted to compare the difference between Under-Graduate and Post-Graduate Woman Students with respect to the Impact of Digital Learning on Academic Performance of woman students of higher education.

Table 5
TYPE OF STUDENT - IMPACT OF DIGITAL LEARNING ON ACADEMIC PERFORMANCE

VARIABLE	TYPE OF STUDENT						t - value	p - value
	Under-Graduation			Post-Graduation				
	N	Mean	SD	N	Mean	SD		
Impact of Digital Learning on Academic Performance	84	10.45	4.598	36	12.39	3.220	3.254	0.006**

Source: Primary Data (** 1% level of Significance)

As the P value (0.006) is lesser than Sig. Value (0.01), the Null Hypothesis is rejected. The mean score of the Post-Graduate woman students (M = 12.39) is more than Under-graduate woman students (M = 10.45). This indicates that Post-Graduate woman students have perceived more impact of digital learning on Academic Performance than Under-Graduate woman students. Hence, there is a significant difference between Under-Graduate and Post-Graduate Woman Students with respect to the Impact of Digital Learning on Academic Performance of woman students of higher education.

H₀: There is no significant difference among the Domain of Study of woman students with respect to the Impact of Digital Learning on Academic Performance of woman students of higher education.

A one-way between-groups analysis of variance (ANOVA) was conducted to explore the significant difference among the Domain of Study of woman students with respect to the Impact of Digital Learning on Academic Performance of woman students of higher education.

Table 6
DOMAIN OF STUDY - IMPACT OF DIGITAL LEARNING ON ACADEMIC PERFORMANCE ONE-WAY ANOVA

VARIABLE	DOMAIN OF STUDY			F - value	p - value
	Arts (52)	Science (35)	Com/Mgt (33)		
Impact of Digital Learning on Academic Performance	10.44	12.87	11.22	2.987	0.023*
	5.110	3.259	3.875		

Source: Primary Data (No. of Consumers are shown in brackets) (*5% Level of Significance)

As the P value (0.023) is lesser than Sig. Value (0.05) in the Academic Performance due to Digital Learning Score, the Null Hypothesis is rejected. Apart from reaching statistical significance, the actual difference in the mean score among the 'Domain of the study' groups is also large (M = 10.44 to 12.87). The Mean score of the woman students who belong to 'Science domain' (M = 12.87) is more than others. Hence, it is inferred that the woman students who belong to 'Science' domain of study have more academic performance due to digital learning than others. Hence, there is a significant difference among the Domain of Study of woman students with respect to the Impact of Digital Learning on Academic Performance of woman students of higher education.

RELATIONSHIP BETWEEN DIGITAL LEARNING FACTORS AND ACADEMIC PERFORMANCE

H₀: There is no significant relationship between Digital Learning factors and Academic Performance of woman students of higher education.

A Pearson product-moment correlation was run to determine the relationship between Digital Learning factors and Academic Performance of woman students of higher education.

Table 7
RELATIONSHIP BETWEEN FACTORS CONTRIBUTING DIGITAL LEARNING FOR HIGHER EDUCATION AND ACADEMIC PERFORMANCE

VARIABLES	N	'r' VALUE	P - VALUE	RELATI ONSHIP	REMARKS	
					SIGNIFICANT	RESULT

Quality of Learning Content – Academic Performance	120	0.706**	0.000	Positive	Significant	Rejected
Convenient in Learning / Usage – Academic Performance	120	0.842**	0.000	Positive	Significant	Rejected
Benefits available – Academic Performance	120	0.754**	0.000	Positive	Significant	Rejected
Covid-19 Pandemic – Academic Performance	120	0.775**	0.000	Positive	Significant	Rejected
Perception on Digital Learning Factors – Academic Performance	120	0.738**	0.000	Positive	Significant	Rejected

Source: Primary Data **. Correlation is significant at the 0.01 level (2-tailed).

As the P values (0.000) are lesser than Sig. Value (0.01) in all the above relationships, the Null Hypotheses are rejected. There are high positive and significant relationship between the factors that contributing Digital Learning and Academic Performance of woman students of higher education. Out of various relationships, 'Convenient in Learning / Usage' has more relationship ($r = 0.842$) with Academic Performance and 'Quality of Learning Content' has lesser relationship ($r = 0.706$) with Academic Performance of woman students. Overall, Digital Learning factors have high positive and significant relationship ($r = 0.738$) with Academic Performance of woman students of higher education.

MULTIPLE REGRESSION ANALYSIS

Multiple Regression Analysis was conducted to determine the best linear combination of the Four factors that contributing/influencing Digital Learning for Higher Education in order to predict the Academic Performance of woman students of higher education.

Table 8
DIGITAL LEARNING FACTORS – ACADEMIC PERFORMANCE
OF WOMAN STUDENTS
MULTIPLE REGRESSION ANALYSIS

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-0.842	.302		-1.992	.044
Quality of Learning Content	.189	.072	.194	2.627	.027
Convenient in Learning / Usage	.327	.054	.332	7.654	.000
Benefits available	.222	0.68	.224	4.523	.000
Covid-19 Pandemic	.243	0.61	.257	6.830	.000

Dependent Variable: ACADEMIC PERFORMANCE OF WOMAN STUDENTS

The combination of all the four independent variables significantly predicts the dependent variable i.e., Academic Performance of woman students of higher education, $F(4, 115) = 385.654$, P values are lesser than 0.01 and 0.05 (Sig. Value 2-tailed) and Adjusted R Square is 0.768 or 77% which is large effect according to Cohen. Out of four factors of Digital Learning, 'Convenient in Learning / Usage' (0.332) is the strongest contributing/influencing factor and 'Quality of Learning Content' (0.194) is the weakest contributing/influencing factor in predicting the Academic Performance of woman students of higher education. From the unstandardized coefficient, it is found that the one unit increase in the 'Convenient in Learning / Usage' would increase the Academic Performance of woman students of higher education by 0.327 units. Other factors of Digital Learning also contribute to Academic Performance of woman students of higher education significantly but lesser than 'Convenient in Learning / Usage.'

FINDINGS, SUGGESTION AND CONCLUSION

The research revealed that Post-graduation students have more perception on the various factors that contributing to Digital Learning tools/applications and have perceived more academic performance than the Under-Graduate Students. The woman students who belong to 'Science' domain of study have more academic performance due to digital learning than others. It is found that 'Convenient in Learning/Usage' has more relationship and 'Quality of Learning Content' has lesser relationship with Academic Performance of woman students and Digital Learning factors have high positive and significant relationship with Academic Performance of woman students of higher education. The study also found that out of four factors that contributing Digital Learning for higher education, "Convenient in Learning/Usage" factor has more impact/influence on Academic Performance of woman students of higher education than others.

The study suggests that the Digital Learning Service Providers, Digitech and Learn-tech companies and Learning App Developers should formulate, amend and implement appropriate policy decisions and strategies relating to design and development of digital learning apps/tools in such a manner that would improve and enhance the learning and academic performance of the woman

students. It is also suggested that the Government along with other related stakeholders should take initiatives to enhance digital infrastructure and improve the digital learning environment of the students.

The present study contributes some useful insights to the policy makers, government, higher education authorities and other stakeholders with respect to the understanding of the impact of digital learning on the academic performance of woman students studying in Government Arts and Science Colleges in Chennai district of Tamil Nadu State. The study would also be useful to the Government colleges to adapt certain effective strategies to improve the influence of digital transformation in higher education during Post Covid-19 pandemic period and thereby enhance the woman education in their colleges. It is expected that the effective and efficient implementation of Digital technology in higher education in India would bring more fruitful benefits to the woman students as well as higher educational institutions in the years to come.

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