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THE MEDIATING ROLE OF SKILL BASED TRAINING  
PROGRAMS ON DEGREE OF INTEGRATION OF E-  
CONTENT IN CURRICULUM DELIVERY AMONGST  
FACULTIES IN HEI'S

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**Mr. Mahesh Madhav Deshmukh and Dr. (CS) Lalita Mutreja: The Mediating Role of Skill Based Training Programs on Degree of Integration of E-Content in Curriculum Delivery Amongst Faculties in HEI's -- Palarch's Journal of Archaeology of Egypt/Egyptology, ISSN 1567-214x**

**Keywords: Technical Skill Training Program, E-content, Educators, Perception, Quality Education.**

**ABSTRACT**

**Aim:** The study aims to assess the degree of the integration of e-content in curriculum delivery and investigate the mediating role of the technical skill training program on the relationship between age of the educator and the degree of integration of e-content in curriculum delivery in higher educational institutes.

**Background:** Educators play a critical role in student's transformation however due to COVID- 19 the disruption has been manifold. Anchoring the Job Demand Resources (JD-R) theory and ADDIE Model the study portrays the current scenario and challenges faced by educators in HEI's on account of situational virtual learning.

**Design:** Primary data was collected with the help of a self-report survey using google forms.

**Methods:** The study uses Andrew Hayes Process Simple Mediation Model number 4 to investigate the mediating role of the technical skill enhancement training programs in wake of constructs and variables. ANOVA is also used to identify the differences between the various groups based on the socio-demographic profile of the educators.

**Results:** The investigation vividly pointed out that the degree of usability and integration of E-content in curriculum delivery varied statistically amongst various age groups. It highlighted the negative significant correlation between age and integration levels adversely affecting the quality of education. However, it

revealed that imparting technical skill training programs significantly mediates the relationship between the age of the educator and the degree of integration of e-content in curriculum delivery.

Conclusion: The study using mixed methods has provided a ground reality check of the current integration levels of e-content delivery in the higher education system. Poor curriculum designing and lack of technical skill training program based on needs and wants of the educators at HEI's has posed a huge challenge towards the virtual teaching and learning ecosystem. Assessing the needs of educators and then intervening through timely technical skill training programs at various levels can ensure not just education on virtual onboard but quality education to all.

## INTRODUCTION

The black swan of COVID 19 has resulted in the largest disruption of the education sector across the world (United Nations)<sup>1</sup> adversely impacting 1.6 billion learners across the globe accounting up to 94% of the world student population and 99% of student in lower and middle group countries. Even though by the year-end of 2020 most economies have opened out in a phased manner, educational institutes have a long way ahead for re-opening due to considerable risk involved. This disruption has not only impacted the student fraternity but also the educators in a big way especially in the lower- and middle-income countries where blackboard was the prominent medium of instruction. This situation is even more grave for higher education institutes and stakeholders as it is the connecting link for the transition from unemployment to employment. Any disruption here impacts the employment levels, the dropout ratio, and the inflow and outflow of students abroad. Moreover, the length and breadth of courses being versatile surging e-content in a short span of time are difficult. But the outbreak has led to situational shifting from black board to virtual board for which the HIGHER EDUCATION ECOSYSTEM was naïve. The crisis though revolutionized the higher education architecture the existing curriculum and pedagogy did not suit the needs of the virtual teaching. Most of the educators here neither had undergone training skill programs nor were equipped with content pedagogy to ensure quality education.

Secondly, Motivation and Morale of these educators has emerged to be a major concern for the administrators. In the midst to fit into the shoes of virtual learning, educators are facing tremendous physical and emotional constraints. Their profession often embroils them to go beyond the curriculum to ensure holistic development. The skills of the educators are critical towards the development of the student into a good citizen and in fact, it is the only profession that creates another profession. Thus, understanding their needs and lacunas to ensure quality education is important.

“Education is not the filling of a bucket but the lighting of a fire” - W.B Yeats

Currently, the educators under tremendous pressure to go for virtual teaching without receiving any intervention from the institutes or affiliating universities have filled the bucket of education but failed to deliver its best. The mandates of virtual teaching are adhered to but lacked the desired level of quality engagement. The gap between the use of technology and educators is wide resulting in lower levels of e-content integration in the curriculum delivery. Anchoring the Job Demand Resources (JD-R) and ADDIE Model the study conducts the need assessment and perception of the educators towards the integration of e-content in curriculum delivery. It also investigates the mediating role of the technical skill training programs on the degree of integration of e-content in curriculum delivery.

## **Background**

This study lays its foundation on Job Demand Resources (JD-R) (Demerouti et al 2007) which identifies job demand and job resources as key influencers in job working conditions and ADDIE Model of Training targeted to improve human performance.

Job demands are the factors which create stress in the working environment and often lead to occupational stress. Whereas job resources are factors which bring positive vibes in the working environment and stimulate employees towards efficient goal achievement. They include training, mentoring, learning and development. The model states that when job demands are high, it is the job resources which can act as breakthrough and offset the negative impact and stress conditions. Associating it with the higher educational sector in this unprecedented and sudden onset of COVID 19 that has caused emotional and occupational stress to educators. It is generally reported that mental and occupational stress amongst educators is much higher than other occupation due to its evolving nature (Brough, Dollard, and Tuckey (2014). This stress becomes even more problematic when the age advances and the educator is not able to cope up with sudden changes in the socio- economic environment.

Considering the current COVID 19 pandemic the job demands evolved drastically taking a toll on psychological well-being of every individual. The situational work from home especially for educators was beyond the imagination and completely offhand that added to mental well-being in a great way. The occupational stress coupled with psychological impact of COVID 19 and very little intervention by the Institute and University affected the morale leading them in confused state. Further, the situation timelines were unknown and hence adaptability delayed but after 3 months of lockdown it was clear that closure of physical college will be for long. The transition from blackboard to virtual board was now mandatory. In other words the job demands were high and necessitated the need for job resources that could serve as path towards acceptance and improved usability of E-content in virtual learning. As evaluated in study Assessment Based Technical Skill Training could now act as job resource enhancing the learning and development process of the evolving role of educator (Adenyi. O.i 1995) (Akinpelu. 1995) Research evidences that Assessment Based Technical Skill Training re-smarts the learning process adding value to the existing knowledge, creativity and improves acceptability towards radical changes (Isyaku . I (2000). “ One Size Fits All” mantra for trainings will not bring out the desired results as each educator has various challenges in line with demographic characteristics. To cite those in early years of teaching i.e Gen Y (millennials) may be well equipped with technology but lack apt content knowledge pedagogy on other hand Gen X have strong content knowledge but poor technical skills to transfer knowledge creatively and innovatively which forms the crux of virtual learning. Learning does not develop in random practice and hence ADDIE Model (Analyze, Design, Develop, Implement and Evaluate). Adhering to ADDIE model the mediating role of technical skill training is evaluated in the study and not just mere trainings based on excerpts from interviews.

## **Materials and Methods**

**Aim & Scope:** The focal of the study encircles to investigate the mediating role of technical skill enhancement training programs while integrating e-content in curriculum delivery in wake of situational virtual teaching due to pandemic COVID 19. The term technical skill enhancement programs in this study is to be understood in parlance with e-content development and delivery training programs with a minimum of 3-day assessment-based training. The effectiveness of periodicity of training is

based on a literature review .The training not satisfying the mentioned minimum criteria were excluded while investigating the mediation role. The degree of integration of e-content in curriculum delivery is measured by determining the usability of different forms of e-content tools and its frequency using a pre-validated Likert scale scoring technique.

**Design:** The data was collected based on a self-report survey through google forms to test the hypotheses. The data is obtained from various districts of the third-largest state of India which is house to people from different parts of the country. The surveyed population represents varying demographic characteristics thus can be considered as a representative sample. Out of 300 shared questionnaires, 192 responses were validated yielding a response rate of 64%. The study also had conducted interviews amongst 12 educators characterized on their age and gender (4 from each baby boomers, Gen X and Gen Y) to assimilate the needs and ensure apt designing of the questionnaire.

**Data Analysis:** The study uses Andrew Hayes Process Simple Mediation Model number 4 to investigate the mediating role of the technical skill enhancement training programs in wake of constructs and variables. While using the model, the age was used as an independent variable while the usability of different forms of e-content tools and its frequency served as the dependent variable and technical skill enhancement training programs was assessed as a mediator based on confirmatory analysis and literature review. All the regression analyses were performed by installing the macro process of Andrew Hayes Model 4 version 3.5 on SPSS 26.

**Validity and Reliability:** All scales used in the study have been published and validated in previous research studies (Atsushi Mizumoto et al 2010) (Galian M Suvillian et al (2013). To ensure the internal consistency of the pre-validated scales measuring the degree of usability of different forms of e-content tools and its frequency was 0.804 and perception towards the acceptability of e-content in curriculum delivery was 0.847. The composite consistency was-0.747 which is above the minimum acceptance level of 0.70 (Anderson and Gerbing 1988) represented in the tabular form as below

**Table 1- Reliability Statistics (Cronbach Alpha)**

1.1 Degree of usability of different forms of e-content tools and its frequency

<b>Reliability Statistics</b>	
Cronbach's Alpha	N of Items
.804	10

1.2 Perception towards acceptability of e- content in curriculum delivery

<b>Reliability Statistics</b>	
Cronbach's Alpha	N of Items
.847	9

1.3 Composite Alpha

<b>Reliability Statistics</b>	
Cronbach's Alpha	N of Items
.747	19

### Results & Discussions

Brief Profile of the respondents demonstrating the varying demographics, conclusive to act as representative sample are as stated below-

Out of 192 valid responses 60.4% were females and 39.6% males. Those working amongst the aided section was 29.2% and unaided 70.8%. At the same the respondents from all the age groups right from 21 to 58 were well represented. Thus, the responses were recorded right from baby boomers, Gen X and Gen Y (Millennials) which influence their acceptability levels towards adaptability and usage of technology in their job profiles and in our study towards curriculum delivery represented in Table no 2.1 Since all the phases were recorded accordingly respondents were as highly qualified as doctorates i.e. 29.7% (Ph.D holders ) and those with Master's degree alone were 60.9%.

Before running the testing of hypotheses power analysis were carried on to assure sample adequacy. As reported under power analysis conducted using SPSS 26 version for behavioral sciences the required N was 63 for regression analysis whereas actual N is 192 assuring sample adequacies.

To identify the apt independent variable (demographic characteristic) to be used for mediating model Correlation tests and Confirmatory analysis demonstrated below results:

<b>Table no 2 : Age of the Respondents</b>		
	N	%
21-30 years	71	37.0%
31-40 years	62	32.3%
41-50 years	45	23.4%
51-60 years	14	7.3%

### Hypotheses Background and Testing

**H<sub>1</sub>: There is significant difference between the degree of integration of e-content in curriculum delivery and the socio- demographic characteristics of an educator.**

The socio - demographic characteristics examined under the study are

1. Age of the Educator
2. Gender of the Educator
3. Educators in Aided and Unaided Colleges (Aided – Those who receive grants from Government and Unaided are self-financed institutes).

The other characteristics such as Martial Status, Qualification and Designation of the Educator were not significantly correlated with the dependent variable and hence excluded from further analysis.

**Age of the Educator**

**Table no 3. Descriptive statistics of Age of Educator and degree of integration of e-content in curriculum delivery**

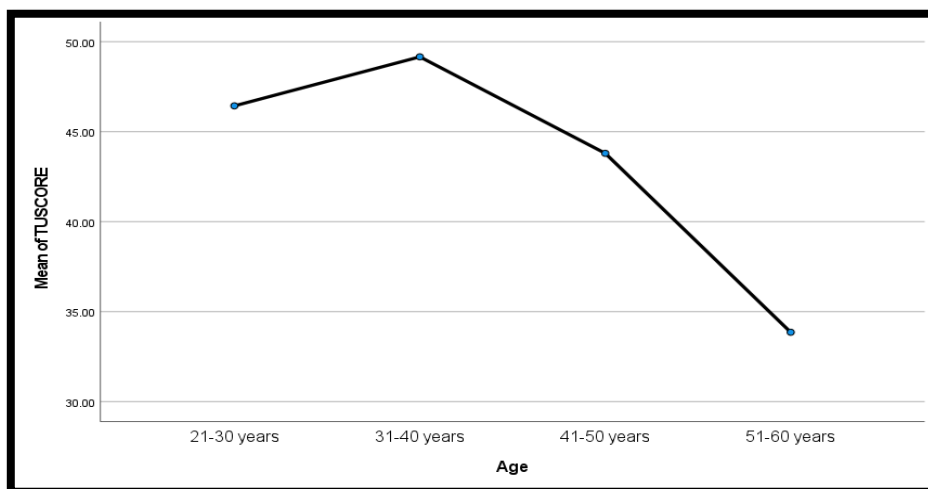
Descriptive						
TUSCORE						
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
21-30 years	71	46.4366	15.18056	1.80160	42.8434	50.0298
31-40 years	62	49.1613	17.28089	2.19468	44.7728	53.5498
41-50 years	45	43.8000	15.28457	2.27849	39.2080	48.3920
51-60 years	14	33.8571	10.47236	2.79886	27.8106	39.9037
Total	192	45.7813	16.01027	1.15544	43.5022	48.0603

**Table no 4 : ANOVA Table**

ANOVA					
TUSCORE					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2906.046	3	968.682	3.954	.009
Within Groups	46052.766	188	244.962		
Total	48958.813	191			

The p value < 0.05 leads to the acceptance of alternate hypothesis stating there is significant difference amongst various age groups in degree of integration of e-content in curriculum delivery. To probe further mean plots are represented which demonstrate as the age of educator advances the usability level falls. Currently due to COVID 19 all the educators are left with no other option but to opt for virtual teaching that was a sudden unprepared situational phenomenon. Moreover, due to health constraints and lower tendencies to adapt to technology the usage was limited to lower degrees of e-content development. The same is graphically presented as below –

Graph 1: Age Wise Mean Plots



**Gender of the Educator**

**Table 5: Descriptive statistics of Gender of Educator and degree of integration of e-content in curriculum delivery**

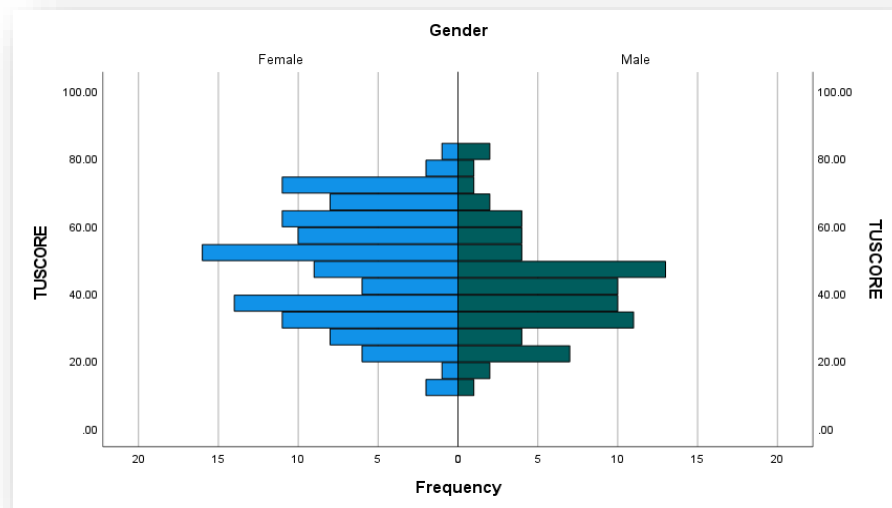
Descriptive						
TUSCORE						
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Female	116	48.2672	16.33314	1.51649	45.2634	51.2711
Male	76	41.9868	14.81845	1.69979	38.6007	45.3730
Total	192	45.7813	16.01027	1.15544	43.5022	48.0603

**Table 6: ANOVA TABLE**

ANOVA					
TUSCORE					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1811.110	1	1811.110	7.299	.008
Within Groups	47147.702	190	248.146		
Total	48958.813	191			

The p value < 0.05 leads to the acceptance of alternate hypothesis stating there is significant gender-based difference in degree of integration of e-content in curriculum delivery. As visualized statistically and diagrammatically females score outperform males significantly.

Graph 2 : Population Pyramid (Genderwise) for Total Usage Score



### 3. Educators in Aided and Unaided Colleges

Table 7: Descriptive statistics of Educators in Aided and Unaided Colleges and degree of integration of e-content in curriculum delivery

Descriptive						
TUSCORE						
	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean	
					Lower Bound	Upper Bound
Aided	56	41.6429	15.70805	2.09908	37.4362	45.8495
Unaided	136	47.4853	15.87777	1.36151	44.7927	50.1779
Total	192	45.7813	16.01027	1.15544	43.5022	48.0603

Table 8

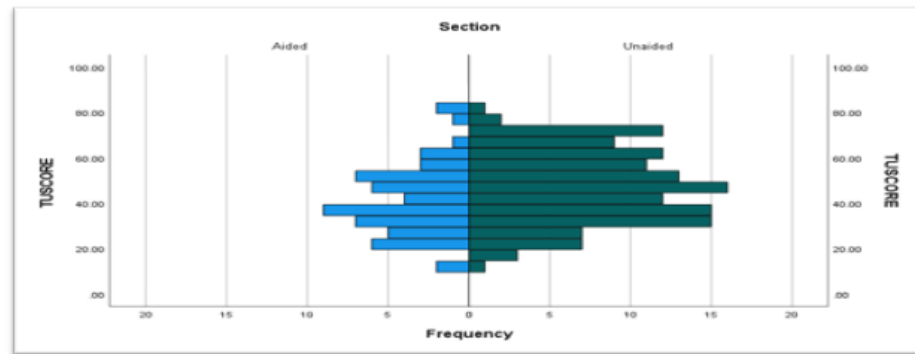
ANOVA					
TUSCORE					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1353.985	1	1353.985	5.404	.021
Within Groups	47604.828	190	250.552		
Total	48958.813	191			

The p value < 0.05 leads to the acceptance of alternate hypothesis stating there is significant difference in degree of integration of e-content in curriculum delivery



amongst of Educators in Aided and Unaided Colleges. As envisaged statistically and graphically the educators in unaided outperform those in aided section. This phenomenon can be further supported with the fact that those in aided section fall under aging category.

**Graph 3:** Population Pyramid (Aided section v/s Unaided Section) for Total Usage Score



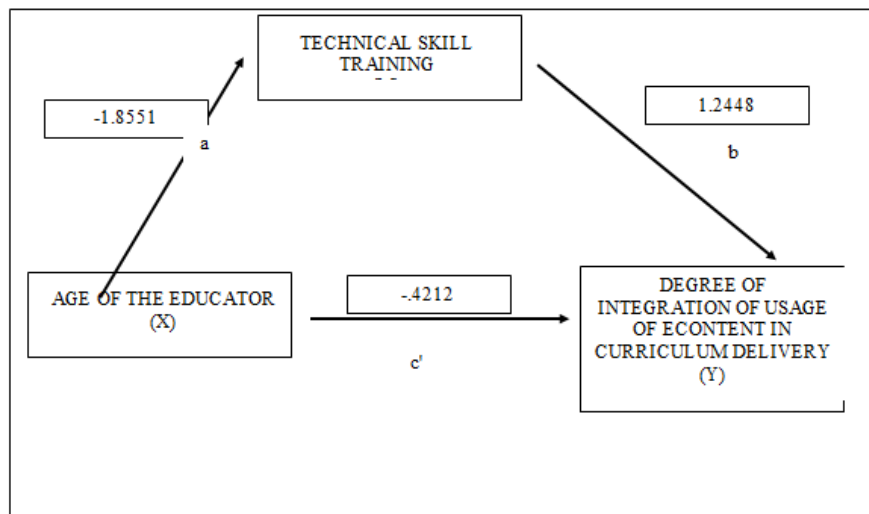
Thus, it is conclusive from the above analysis there is significant differences in degree of integration of e-content in curriculum delivery based of significant socio-demographic characteristics of an educator.

It is well established that as the age increases the tendency to integrate technology falls down due to various constraints. The proposition was verified from our data as above. Moreover, due to pandemic COVID 19 usage of E-content in the curriculum delivery was situational and unprepared. But this has now become an indefensible part of pedagogy in the higher education institutes. Thus, the study here in its next hypothesis which remains focal of the study evaluates the mediating effect of technical skill enhancement training programs to overcome this limitation in the long run using Andrew Hayes Process Model 4 using SPSS.

**H<sub>2</sub>: Imparting Technical Skill Training Program significantly mediates the relationship between age of the educator and the degree of integration of e-content in curriculum delivery.**

The unpreparedness towards embracing situational virtual teaching was complex and immediate for both the Educators and the Higher Educational Institutes. Neither the curriculum pedagogy was defined in lines with virtual learning nor trainings were imparted. Even after 6 months of learning nothing concrete has been designed to overcome the versatile challenges confronting the educators in terms of technical glitches and health constraints due to sudden shift from blackboard to virtual board. Currently we are facing the aging faculty in higher education institutes with a median age of 49 years (AISHE Report 2018-19). Secondly aging will always be persistent and at same time it adds to the knowledge the rich varied experiences of the educators. To overcome this technical hindrance associated with age the study evaluates the mediating role of technical skill training program as below

The simple mediating model is illustrated diagrammatically as below-



OUTCOME VARIABLE:							
Training							
Model Summary							
R	R-sq	MSE	F	df1	df2	p	
.1475	.0518	139.9792	4.2282	1.0000	190.0000	.0411	
Model							
coeff	se	t	p	LLCI	ULCI		
constant	25.7504	2.0047	12.8451	.0000	21.7961	29.7047	
Age	-1.8551	.9022	-2.0563	.0411	-3.6347	-.0755	

**Table 3: Path a to b**

The direct path from independent variable Age of the Educator and those obtained and acceptance towards Technical Skill Training is negative ie ( - 1.8551) with a significant p value (p <0.05) denoting that as the age advances the tendency to undergo training programs is low.

**Table 4: Path a to c' and b to c'**

OUTCOME VARIABLE:							
TUSCORE							
Model Summary							
R	R-sq	MSE	F	df1	df2	p	
.9316	.8679	34.2217	620.8183	2.0000	189.0000	.0000	

Model						
coeff	se	t	p	LLCI	ULCI	
constant	19.2173	1.3549	14.1837	.0000	16.5446	21.8899
Age	-.4212	.4510	-.9338	.0351	-1.3108	.4685
Training	1.2448	.0359	34.7012	.0000	1.1740	1.3155

The direct path between age and degree of integration of e-content in curriculum delivery is -.4212 which verifies the fact that as the age of the educator increases the tendency to embrace higher degree of e-content in curriculum delivery decreases. However not just mere training but technical skills training portray a significant positive impact of 1.2448 on degree of e-content in curriculum delivery.

**Table 5 Direct and Indirect Effects**

Direct effect of X on Y					
Effect	se	t	p	LLCI	ULCI
-.4212	.4510	-.9338	.0351	-1.3108	.4685
Indirect effect(s) of X on Y:					
Effect	BootSE	BootLLCI	BootULCI		
Training	-2.3092	1.0613	-4.3379	-.1927	

Note : Level of confidence for all confidence intervals in output: 95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals: 5000

The indirect effect is measured using non parametric bootstrapping. Since the 0 lies outside the LLCI and ULLCI the indirect effect of the mediator is said to be non-zero. Thus leading to acceptance of the alternate hypothesis. It further leads to conclude that technical skill training when mediated reduces the negative impact of the age with degree of usability of e-content in curriculum delivery paving way to quality virtual education.

**Theoretical Contributions**

The study makes multiple contributions in varied forms by filling the void in the literature especially in wake of the pandemic and educational sector in India. The study examines and measures the mediating role of the technical skill training program on the degree of integration of e-content in curriculum delivery. This area had been left unexplored with regards to higher education sector and the literature had been thin.

The study indirectly reveals the mediocre quality of education in terms of the integration of e-content tools in curriculum delivery. In a broader sense, India like most of the countries are committed to the attainment of Sustainable Development Goals (SDG) by 2030 wherein providing quality education (SDG 4) remains prominent. This study is capable of steering the stakeholders in the right direction and work towards efficient utilization of resources. The study highlights the loopholes in the current education system wherein training are do provide and in fact are mandatory for career advancement but lacks effectiveness and translation. Empirical evidence in

terms of the poor quality of the education system in the country are abundant but very few have quantified and highlighted the disparity levels. Prior to COVID 19, MOOC

(Massive Open Online Courses) though established in 2005 never received its due integration into the system. Even today, though situational virtual teaching has been on board the tools used remain at the brink of quality.

The study thus integrates the JD- R model along with ADDIE which has been a rare phenomenon in the literature. Exploring the proposed role of technical skill training programs through the lens of JD- R theory and ADDIE model are relevant in the present scenario of pandemic COVID 19 and the infusion of virtual teaching and learning. It proposes a deeper understanding of the needs of educators through the ADDIE model and the strategic implications of the job resources in the due course.

Lastly, the study significantly contributes in terms of the sample under study bridging the gaps in the perceived and existing usability of e-content in the curriculum delivery. Conducting need analysis of the educators and then bridging the gap of improved virtual teaching has turned out to be an important agenda at various levels with a vision to achieve broader goals of quality education to all. The results have well displayed that apt technical skill training programs can foster efficacy and positive attitude of the educators towards this sudden situational transformation in the long run.

### **Practical Implications**

The study has vital implications in the higher education sector which is evolving and calling out for unplanned changes in wake of COVID -19. The higher education sector is characterized by increasing work demands and limited resources to provide job satisfaction and motivation to educators. In such a scenario, generating a positive attitude and behavior in terms of adaptability to change is critical. Extracting the excerpts from the study it has been observed that most of the training programs have inadvertently failed to arouse the interest and positivity amongst the educators. They rendered little or no help to educators. Thus the study implies to first conduct the need assessment of the educators (ADDIE MODEL) with simultaneous revisions in the curriculum designing to match the pedagogy of virtual teaching and learning. Realistic job previews of the whole system need to be studied and communicated which shall lead to grandiose expectations and act as a good fit in teaching pedagogy. The study emphasizes the adoption of a holistic approach towards a supportive working environment that can act as a game-changer (job resources). Currently the Institutes, Affiliating Universities and MHRD intervention in this arena has been on the lower side and lacks ground reality. Adopting a need-based approach with apt regular intervention from various levels of the hierarchy can lead to quality virtual learning.

### **Limitations and Directions for future research**

Despite the significant contribution of the study in area of virtual teaching and learning ecosystem it faces certain procedural and analytic limitations. It doesn't consider the limitations of curriculum design for virtual ecosystem. Also student perspective has been excluded.

Inferences drawn are based on cross – sectional study and hence for generalizations longitudinal study needs to be carried out. Research in future can be carried out on larger population at Institutional, University and MHRD level just as AISHE (All India Survey of Higher Education) is conducted annually mandatorily.

## CONCLUSION

The study provides deeper and practical challenges confronting the quality virtual teaching learning systems. It makes two major contributions for the policy makers first the integration ADDIE Model while designing technical training modules, career advancement schemes and redesigning the curriculum with detailed teaching pedagogy in the higher education. Currently there is no technical training is provided to the educators who frame as well those who implement the curriculum. This has led to lower levels of integration of e-content in the teaching ecosystem. Secondly the positive outcome through mediating effect of technical training is well highlighted which can resolve the problem of aging and resistance to change scenario in the ecosystem. The study using mixed methods has provided a ground reality check of the current integration levels of e-content delivery in higher education system.

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This research study has not been funded by any agency.

## Conflict of Interest.

No conflict of interest has been declared by the authors.

## Author Contributions

Both the authors have contributed substantially to the concept, design acquisition and interpretation of data.

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