Impact of COVID 19 on Managing Organizations Virtually: A Study on Strategic Changes with Reference to Teaching Professionals

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Abstract: Due to Corona Virus Pandemic a digital divide in the Indian conventional Education system is noticed. As a result, educational institutions turned their attention to the Ed-Tech after the closure of schools/colleges due to lockdown. This paper is used to analyze how an organization in education sector can effectively bring in strategic development using technology. Challenges faced by employees, currently in the educational sector are studied and interpreted using cause-effect relationship dematel analysis. This study will offer insights for people who are planning for online digital working system in educational sector.

Keywords: E-learning, Virtual Organization, COVID-19, Challenges, Educational Sector

1. Introduction

Despite the pandemic's devastating effects, this environmental catastrophe has also provided an unprecedented opportunity for learning. We are gaining insight into the adaptability and resilience of school programs, policymakers, teachers, pupils, and families. Education is characterized differently today than past, when teaching started. The printing press era truly democratized learning, this resulted in a revived form of education, which included the construction of school buildings and classrooms, segmentation of students by age and position, and regularly scheduled tests, among other things; thereby laying the groundwork for what we now refer to as the current education system.

Forward to the year 2020, threatened by COVID-19, the education sector has probably faced the most difficulty. Numerous previous ideas had to be abandoned in light of the fact that the modern educational system is facing the most radical transformation in history; it has never been disrupted at the fundamental stage internationally until now. Entrepreneurs from all around the world are developing software and services to assist students in navigating and learning by simplified processes; this is in light of the assumption that Gen Z and Gen Alpha will be on the receiving end of this huge change.

E-learning can continue to evolve at a breakneck rate, regardless of age, place, or topic. Understanding and adaptation of mobile technologies (smartphones, tablets, and laptops) as well as the increasing global need of the internet. EdTech companies are collaborating

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with service vendors, independent subject specialists, and a variety of universities to deliver teaching and coaching to learners worldwide; the convenience of studying from distant locations is driving market demand for this mode of instruction. At the moment, approximately 580 million Indians have internet connectivity, of which 350 million are frequent users. This figure is projected to reach half a billion by 2022. We will have had tremendous progress in the learning curve for the next two decades, relative to what it was in 2000-2020. This educational transition has the potential to have a profound effect on future generations and the economy. Teachers' roles are increasingly changing, becoming more difficult in certain ways than they were when learning took place solely in person.

Role of teachers in Pandemic: Two vital factors have shifted as a result of the pandemic. To begin, significant pedagogical adaptations were required, as traditional in-person lecturing methods do not transfer well to a distance learning setting. Whichever media is utilized (radio, tv, telephone, or internet networks, for example), teachers must vary their practices and be creative in order to keep students engaged, since any home has essentially become a classroom without a favorable learning environment. Certain countries provide financial assistance to teachers in this effort. In How policymakers can support teachers during the reopening of schools?

To re-establish better education systems, countries must take the successful teaching interventions from the remote learning process and incorporate them into the daily education framework. It is important to inspire teachers by engaging in the requisite professional growth and capacity building so that remote and blended learning can fully realize their potential. Equally critical is to free teachers' time from logistical duties (as Brazil, Peru, and Uruguay have done), to concentrate on pedagogically productive practices, and to provide teachers with socio-emotional assistance.

2. Literature Review

Proserpio et al. (2007) suggest certain fundamental learning concepts in light of the learning patterns of today's students, who are very adept at using interactive technology. We contend that successful use of such interactive learning resources can provide students with valuable and stimulating educational tools by catering to this generation's demand for virtual technology while also allowing student- directed interactivity (via online searches, games, simulations, etc.). We begin by articulating the philosophical underpinnings of our argument that there has been another change in the teaching and learning world under which we now find ourselves—a shift that necessitates any adaptation of conventional learning concepts. The following sections discuss: (a) some technology and software (primarily Internet-based platforms and videogames) that may aid in the convergence of virtual generation (V-Gen) interests and classroom interactions; (b) some

recommendations for implementing these technologies in accordance with these learning principles; and (c) some risks that may arise and how to prevent them.

Guasch et al. (2010) makes an effort to shed light on the competencies required of a university instructor in order to teach in interactive learning environments. A teacher education experience was developed using analytical guidelines defined in accordance with previously established theoretical principles. Our primary purpose in conducting this study was to ascertain the accomplishments and challenges associated with a particular formative experience in order to determine the suitability of this conceptual-methodological approach for developing teaching proposals aimed at developing teachers' competencies for simulated environments in higher education.

Lynch et al. (2017) find that virtual laboratories are critical in the ongoing evolution of realistic teaching in STEM (Science, Technology, Engineering, and Mathematics) education because they address obstacles that teachers encounter in conventional labs, such as giving immediate guidance to students, keeping them interested and inspired, and allowing all students to conduct experiments at their own pace. Additionally, they reduce the set-up and repair costs associated with laboratory management, while eliminating hazardous conditions and spatial constraints. This article addresses the current state of virtual labs in education and presents the NEWTON virtual labs, which are being developed as part of a large-scale H2020 initiative. Additionally, the report introduces a preliminary analysis that used questionnaires and interviews to ascertain teachers' perspectives and challenges. The preliminary findings show that the primary difficulties facing teachers in a science classroom include promoting learning for both slow and quick learners, providing individual guidance, and engaging and motivating students. The findings indicate that teachers prioritize immediate guidance to pupils, the capacity for inquiry-based learning, the use of technologies, and the absence of hazards.

Limniou et al. (2010) conducts research to ascertain how teachers and students saw the use of interactive learning environments (VLEs) in engineering education and their aspirations for online courses. Teachers planned their online courses with the help of an e-learning support staff, and questionnaires were used to solicit feedback from teachers and students about the online courses. Teachers emphasized that online classes would be capable of addressing lecture time constraints and enhancing students' context information on their own. On the other hand, students indicated that their problems with the courses could be alleviated by a more collaborative teaching style that incorporates teamwork resources and participant input. Thus, students recommended that teachers use a VLE to take a more student-centered approach. The experiences of teachers and students were linked to their personal attributes, with students becoming more familiar with popular e- communication tools.

3. Methodology

The Primary data is quantitative and is collected during the period December 2020 – March 2021, through a matrix questionnaire from 25 Experts who were working virtually in Educational Sector due to pandemic lockdown. The Secondary data is collected through research papers, digital news-papers.

A convenience sampling method was used to select 25 experts (11 males and 14 females) from various private B schools in Bangalore for the interview. The participants were between the ages of 35 and 50. The experts had worked in the educational sector for a minimum of ten years. Individuals were interviewed/survey for approximately 15–20 minutes each. Throughout the interview, participants were guided in determining the degree to which each factor has an effect on the others. As shown in Table 1, each researcher was required to complete a sequence of closed-ended matrix questionnaires utilizing a linguistic scale to indicate the variables influenced which others. Individual responses were coded to facilitate the development of a cause–effect diagram utilizing the normalized results. The paragraphs that follow detail the main steps involved in creating a cause–effect relationship diagram.

Decision making trial and evaluation laboratory (DEMATEL) is a well- established technique for identifying the cause-effect chain components of a complex system. It is concerned with evaluating the interdependence of factors and identifying the critical ones using a visual structural model. A considerable amount of interest has been focused on this approach over the last decade, and it has been used to solve difficult problems in a variety of fields. At an increasing rate, it is employed to solve social, educational, and even economic problems (Gołąbek, 2018; Al- Samar, et al., 2018).

4. Dematel Model

DEMATEL method's primary benefit is that it brings order to the multi-criteria decision-making field (Muhammad and Cavus, 2017). Approximately, here are the basic steps to DEMATEL:

Figure 1: Factors impacting Virtual Education Sector

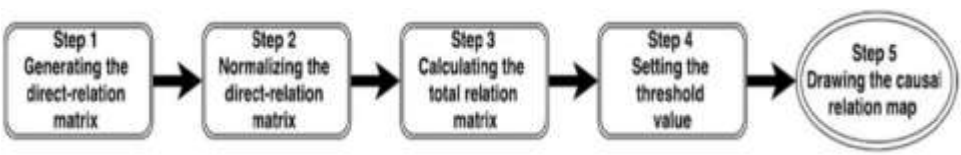


Figure 2: Dematel- Steps

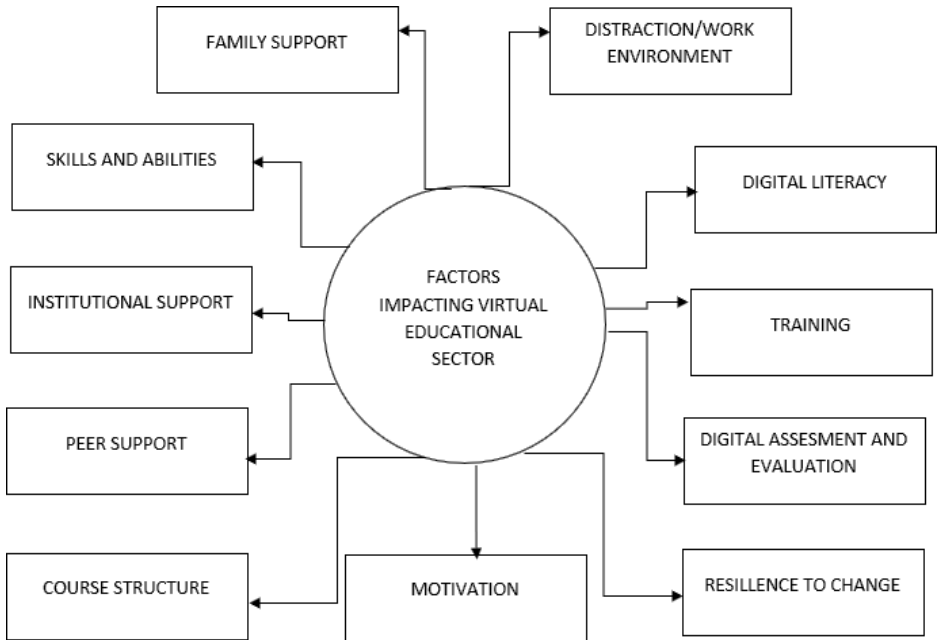


Table 1: Matrix questionnaire

FACTORS	CODE	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
Family Support	F1											
Motivation	F2											
Distractions / work environment	F3											
Skills and abilities	F4											
Digital Literacy	F5											
Institutional Assistance and support	F6											
Training/Orientation for technological adaptation	F7											
Peer Support	F8											
Digital Assessment and Other Criteria for Evaluation	F9											
Course Structure and alignment with technology	F10											
Resilience to change	F11											

Step 1: To identify direct-relation matrix

Firstly, every respondent value is collaborated in the form of initial matrix by summing up the factor values of row i and column j to estimate the level of influence among factors. X^k_{ij} represents influence level of Factor i on Factor j. Eq. (1) gives **F** × **F** matrix, F_{ij} =0 when i=j (diagonal of the matrix is set 0, there is no influence).

$$A = \begin{bmatrix} 0 & \dots & F_n \\ \vdots & \ddots & . \\ F_{n1} & \dots & 0 \end{bmatrix} \qquad F_{ij} = \frac{1}{H} \sum_{K=1}^{H} X_{ij}^{K} \tag{1}$$

Where, H is the total number of respondents.

Table 2: Direct Matrix

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	**RSUM**
F1	0	3.1	1.8	2.9	2.5	2.7	2.9	2.2	3.3	2	2.1	25.5
F2	3.4	0	1.8	3.1	2.8	2.8	3.1	2.3	3.1	2.2	2.4	27
F3	3	2.8	0	2.9	2.8	2.5	3	2.5	3	2.1	2.5	27.1
F4	2.7	3.1	2.7	0	3.1	2.7	2.7	2.5	3.1	2.3	2.6	27.5
F5	2.1	2.4	2.6	2.3	0	2.2	2.3	2.5	2.6	1.9	1.8	22.7
F6	2.3	2.7	2.1	2.8	2.5	0	2.1	3	2.6	2.2	2.7	25
F7	3.2	2.6	2.6	2.8	2.6	2.5	0	2.7	3.3	2.5	1.9	26.7
F8	3.2	3.1	2.2	2.1	2.4	1.7	2.8	0	2.6	2.5	2.5	25.1
F9	2.8	2.6	2.4	2.8	2.6	2.6	2.8	1.9	0	2.5	1.9	24.9
F10	1.8	2.7	1.9	2	2.3	1.7	1.8	2.5	2.4	0	2	21.1
F11	2.7	2.9	2.4	2.1	2.7	2	2.8	3	3	2.8	0	26.4
CSUM	27.2	28	22.5	25.8	26.3	23.4	26.3	25.1	29	23	22.4	

The higher value in matrix represents high influence of factors where an improvement is required in i to improve j factor.

Step 2: Normalizing the direct-relation matrix

To minimize redundant variables, normalized direct relation matrix for Fs is calculated by finding S which is the maximum of summation of row and column values. A represents direct relation matrix values. To calculate Result matrix X, A is divided by S as given in the Eq. 2 and 3. Normalized Matrix is shown in table 3.

$$S = max\left(\underset{1 \le i \le n}{max} \sum_{j=1}^{n} F_{ij}\,,\ \underset{1 \le j \le n}{max} \sum_{i=}^{n} F_{ij}\right) \tag{2}$$

$$X = A/S \tag{3}$$

Table 3: Normalized Direct Relation Matrix

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
F1	0.00	0.11	0.06	0.10	0.09	0.10	0.10	0.08	0.12	0.07	0.08
F2	0.12	0.00	0.06	0.11	0.10	0.10	0.11	0.08	0.11	0.08	0.09
F3	0.11	0.10	0.00	0.10	0.10	0.09	0.11	0.09	0.11	0.08	0.09
F4	0.10	0.11	0.10	0.00	0.11	0.10	0.10	0.09	0.11	0.08	0.09
F5	0.08	0.09	0.09	0.08	0.00	0.08	0.08	0.09	0.09	0.07	0.06
F6	0.08	0.10	0.08	0.10	0.09	0.00	0.08	0.11	0.09	0.08	0.10

Table 3 continued

F7	0.11	0.09	0.09	0.10	0.09	0.09	0.00	0.10	0.12	0.09	0.07
F8	0.11	0.11	0.08	0.08	0.09	0.06	0.10	0.00	0.09	0.09	0.09
F9	0.10	0.09	0.09	0.10	0.09	0.09	0.10	0.07	0.00	0.09	0.07
F10	0.06	0.10	0.07	0.07	0.08	0.06	0.06	0.09	0.09	0.00	0.07
F11	0.10	0.10	0.09	0.08	0.10	0.07	0.10	0.11	0.11	0.10	0.00

Step 3: Total relation matrix of Fs

Total relation matrix T, is calculated using the formula in Eq. (4). Table 4 represents the total affect matrix:

$$T=X(I-X)^{-1} \quad (4)$$

Where, I represents identity matrix

Table 4: Total Relation Matrix

	F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11
F1	0.87	0.99	0.79	0.92	0.92	0.85	**0.94**	0.87	**1.03**	0.81	0.79
F2	**1.02**	**0.93**	0.83	**0.97**	**0.97**	**0.89**	**0.99**	**0.91**	**1.07**	0.85	0.84
F3	**1.02**	**1.03**	0.77	**0.97**	**0.98**	**0.88**	**0.99**	**0.93**	**1.07**	0.85	0.84
F4	**1.02**	**1.05**	0.86	**0.89**	**1.00**	**0.90**	**0.99**	**0.93**	**1.08**	0.87	0.86
F5	0.85	0.88	0.74	0.82	0.75	0.75	0.83	0.80	**0.91**	0.73	0.71
F6	**0.93**	**0.96**	0.78	**0.90**	**0.90**	0.74	**0.90**	0.88	**0.99**	0.80	0.79
F7	**1.01**	**1.01**	0.84	**0.95**	**0.96**	0.87	0.88	**0.92**	**1.06**	0.85	0.81
F8	**0.96**	**0.97**	0.79	**0.88**	**0.90**	0.80	**0.92**	0.78	**0.99**	0.81	0.79
F9	**0.94**	**0.95**	0.79	**0.90**	**0.90**	0.83	**0.91**	0.84	**0.90**	0.80	0.77
F10	0.79	0.83	0.67	0.76	0.78	0.69	0.76	0.75	0.85	0.62	0.67
F11	**0.98**	**1.00**	0.82	**0.92**	**0.95**	0.85	**0.96**	**0.92**	**1.04**	0.85	0.74

Step 4: Threshold value

The threshold value = **0.88** is determined by taking the average of total matrix T, it is used to eliminate least significant values from the total matrix T and it impacts in casual relation mapping.

Table 5: Cause/Effect relation

Code-Factors		**R**	**C**	**R+C**	**R-C**	**Cause/Effect**
F1	Family Support	9.761383	10.36878	20.13017	**-0.6074**	**Effect**
F2	Motivation	10.27031	10.59283	20.86314	**-0.32251**	**Effect**
F3	Distraction	10.32553	8.674005	18.99954	1.651525	Cause
F4	Skills And Abilities	10.44115	9.888791	20.32994	0.552362	Cause
F5	Digital Literacy	8.765148	10.01977	18.78492	**-1.25462**	**Effect**

Table 5 continued

F6	Institution Support	9.568489	9.056166	18.62466	0.512322	Cause
F7	Training	10.15127	10.04998	20.20125	0.101289	Cause
F8	Peer Support	9.599159	9.528292	19.12745	0.070867	Cause
F9	Digital assessment Evaluation	9.526102	10.97464	20.50074	**-1.44854**	**Effect**
F10	Course structure With technology	8.161082	8.837037	16.99812	**-0.67595**	**Effect**
F11	Resilience To Change	10.02502	8.604354	18.62937	1.420666	Cause

Step 5: Drawing the causal relation map

$$T = [t_{ij}]_{n\times n} \text{ i,j} = 1,2,\ldots,\text{n} \quad (5)$$

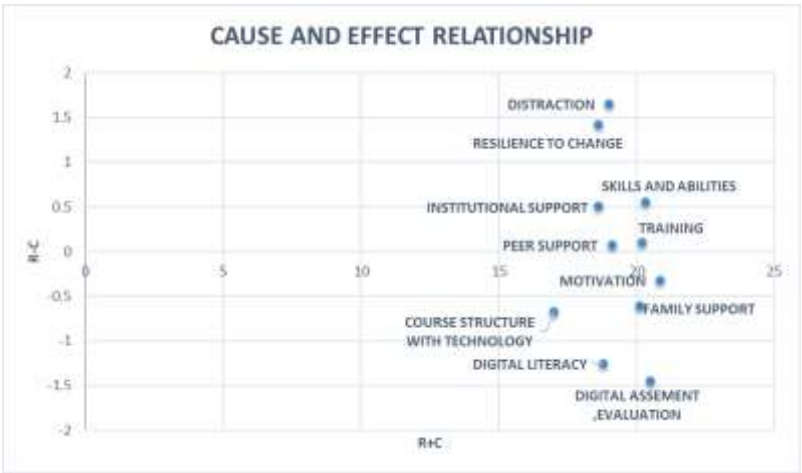
$$D = \sum_{j=1}^{n} t_{ij} \quad (6)$$

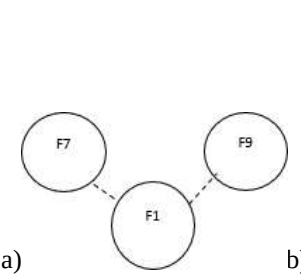
In order to differentiate them as being positive and negative, or summing values in Eq.5 drew a vector and labelling it as a D to distinguish it as being either a value or a negative by using the vector R. (5). To refer to the significance and its impact, we can say that D is a type of quantity that represents the degree of influence of other factors have on the resulting variables, namely the amount of influence on the result has. which denotes both the amount and R which represents both the total amount of impact received by the factor j from all other factors, and R D, which is known as R.' (the degree of influenced impact). causally for the two-providing the horizontal graph; to represent this, the 'Prominence' factor was defined (made explicit) as the importance (significance)of the rule and assigned to the I item along the axis (the whole model map was given the name 'Role'). Table 6, given that the two relationships in Equations (6) and (7), was this table related to (R+C) or (R-C)?

$$R = \sum_{i=1}^{n} t_{ij} \quad (7)$$

With regard to Table 5, Figure 3, and Graph, the overall results show that such conditions can have an effect on compassion levels when functioning electronically. With this study, it was discovered that there are many associations between the reasons known for compassion. The most important association between these factors can be determined using this study. The intertwined lines between the variables represent the direction of the interaction between the factors that influence and those that are influenced. The cause graph, on the other side, displays the net cause/effect value (RiCi), with RiCi>0 indicating a cause barrier and RiCi = 0 indicating an effect barrier.

Figure 3: Cause -Effect relationship





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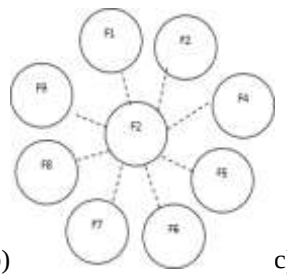

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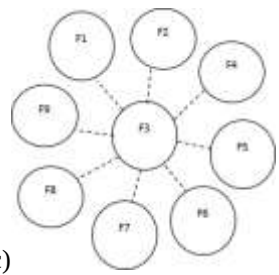

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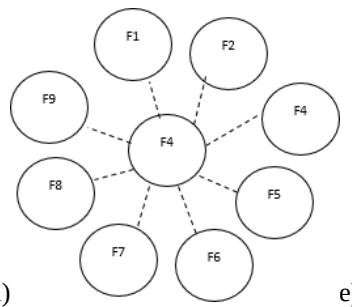

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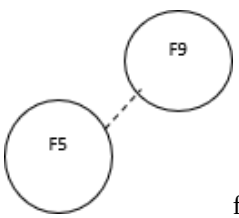

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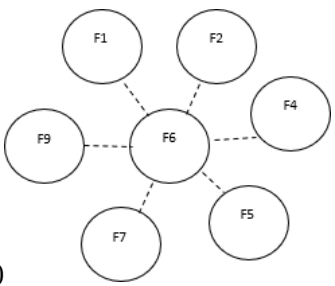

f)

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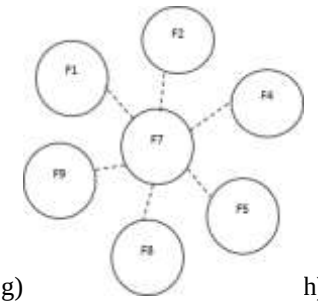

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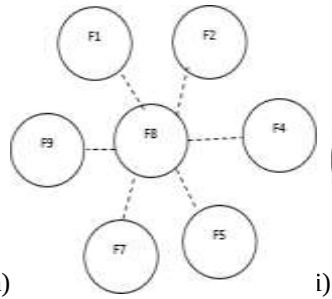

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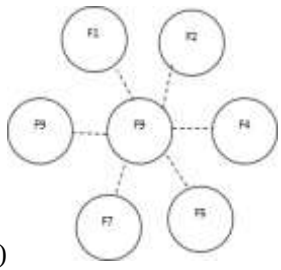

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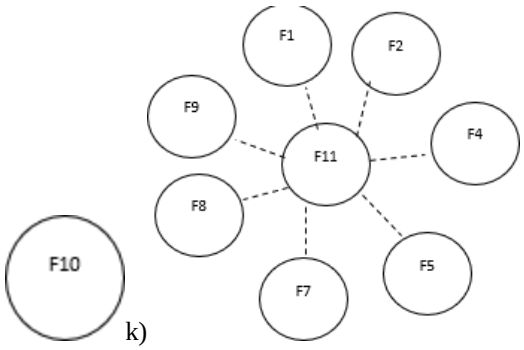

j) k)

Graphs: a) F1-Family Support b) F2-Motivation c) F3-Distraction d) F4-Skills and Abilities e) F5- Digital Literacy f) F6-Institution Support g) F7-Training h) F8-Peer support i) F9-Digital Assessment and evaluation j) F10-Course structure with technology k) F11-Resilience to change

5. Key Findings

There are six causes -distraction, skills and abilities, institution support, training, peer support and resilience to change the effects are family support, motivation, digital literacy, digital assessment & evaluation and course structure alignment with technology. The most important factors impacting digital working environment in organization ranked with high influential level to the lowest level are distraction, resilience to change, skills and abilities, institutional support, training and peer support contrary to the important criteria negative values which are net receivers or effects are digital assessment and evaluation, digital literacy, course structure with technology, family support and motivation.

7. Conclusion

The government should help EIs develop their capacity to perform virtual educational activities. Furthermore, since the majority of students cannot afford these facilities, students require expanded access to the internet and technology. In this pandemic, EIs should put a stronger focus on digital educational activities such as television, radio, and web-based schooling. The COVID-19 will never be eradicated, according to the WHO, and citizens will have to adapt to live with it. "It is important to recognize that this virus will become another endemic virus in our communities and that it will never go away." Several countries are now considering continuing education through distance or virtual mode, and India should follow suit. Indian classical expertise is well- known in the world for its technological advances, traditions, and advantages in the development of sustainable technology and medicines, and these knowledge structures in a variety of fields can be incorporated into a modern mainstream higher education structure. If the pandemic of COVID- 19 persists, educational institutions should follow novel approaches to academic evaluation. Academic evaluations of students can be conducted online or through quizzes and small projects. The study with current scenario in educational system has found 6 challenging cause and 5 effects through analysis causes: distraction, skills and abilities, institution support, training, peer support and resilience to change, and the effects are family support, motivation, digital literacy, digital assessment & evaluation and course structure alignment with technology. Hence focusing more on causes will gradually reduce the effects and will lead to successful implementation of virtual working in educational organization.

Educators and learners should be educated in the use of technology-enhanced multimedia training and learning processes. Governments/educational institutions should follow a policy of providing free internet and interactive devices to all students in order to promote online learning, which will engage people and keep them safe during a pandemic (Pravat, 2020c). Immediate action is taken to mitigate the pandemic's impact on career offers, internship opportunities, and research projects. Several online learning sites provide various programs on the same subject with varying qualification standards, methodologies, and evaluation criteria. As a result, the quality of programs can vary between online learning platforms. Thus, in light of the exponential growth of online learning sites, the education system in India must build and provide quality assurance frameworks and quality benchmarks for online learning programs.

References

Bridgstock, R., 2016, Educating for digital futures: what the learning strategies of digital media professionals can teach higher education.Innovations in education and teaching international, 53(3), 306- 315.

Guasch, T., Alvarez, I. and Espasa, A., 2010, University teacher competencies in a virtual teaching/learning environment: Analysis of a teacher training experience. Teaching and Teacher Education, 26(2), 199-206.

Jandrić, P., Knox, J., Besley, T., Ryberg, T., Suoranta, J. and Hayes, S., 2018, Post-digital science and education. Educational Philosophy and Theory, 50(10), 893–899. https://doi.org/10.1080

Limniou, M. and Smith, M., 2010, Teachers' and students' perspectives on teaching and learning throughvirtual learning environments. European Journal of Engineering Education, 35(6), 645-653.

Lynch, T. and Ghergulescu, I., 2017, NEWTON virtual labs: introduction and teacher perspective. In 2017 IEEE 17th International Conference on Advanced Learning Technologies (ICALT) (pp. 343-345).

MHRD notice, 2020, COVID-19 Stay Safe: Digital Initiatives. Retrieved on May 25, 2020.fromhttps://www.mohfw.gov.in/pdf/COVID19.pdf /educationresponse. Accessed 15 April 2020.

MHRD online, 2020, Online Learning Resources of MHRD. Retrieved on June 6, 2020 from https://mhrd.gov.in/sites/upload_files/mhrd/files/upload document/Write_up_online_ learning_resources.pdf.

Ministry of Education of P.R. China, 2020, Guidance on the Organization and Management of Online Teaching in the Higher Education Institutions During Epidemic Prevention and Control Period. Ministry of Education, Peoples Republic of China.

Proserpio, L. and Gioia, D. A., 2007, Teaching the virtual generation. Academy of Management Learning & Education, 6(1), 69-80.

Ramesh, S., 2020, What it means for COVID to never go away and become endemic- like HIV, malaria, measles, 2020. Retrieved on June 2, 2020 from https://theprint.in/health/what-it-means-for-COVID-tonever- go-away-and-become-endemic-like-hiv-malariameasles/423217/

UGC notice, 2020, UGC Guidelines on Examinations and Academic Calendar in view of COVID- l9 Pandemic Retrieved on June 5, 2020. from https://www.ugc.ac.in/

pdfnews/5369929_Letterregarding- UGC-Guidelines-on- Examinations-andAcademic-Calendar.pdf.

UNESCO, 2020, COVID-19 Educational Disruption and Response. https://en.unesco.org/COVID19.

UNESCO, 2020, COVID-19 Educational Disruption and Response. Retrieved on June 3, 2020 fromhttps://en.unesco.org/COVID19/educationresponse.

WHO, 2020, WHO Coronavirus Disease (COVID-19) Dashboard. Retrieved on June 3, 2020. fromhttps://COVID19.who.int/

Wikipedia, COVID-19 Pandemic in India. Retrieved on May 20, 2020 fromhttps://en.wikipedia.org/wiki/COVID19_pandemic_in_India.

Wikipedia, Education in India Retrieved on May 24, 2020. fromhttps://en.wikipedia.org/wiki/Education_in_India.