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# A thorough investigation into the effects of COVID-19 on education

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Abstract: COVID-19 is the primary cause of the lockdown in numerous countries, resulting in significant changes in the education system and employability sector. These sectors have dramatically changed, which causes innovations to meet unpredictable challenges. It explores how the education system is affected in different ways. What kind of problems do people face? How people have overcome those by creating innovative solutions and what might happen next in education. The pandemic also affects employment by making changes to traditional work setups. Additionally, the abstract touches upon creative adaptations, like technology updating and digital innovations. These abstract underscores the dynamic changes and adaptations brought about by the pandemic in both the education and employment sectors.

*Keywords: Innovative solutions, E-learning, Challenges, Adaptations*

## I. INTRODUCTION

With COVID-19 the world has witnessed unexpected disruptions in daily life. Some of the most affected sectors are education and employability sectors where the pandemic completely changed the way people work before the pandemic. How eLearning sustains higher education and fosters resilience while conducting a thorough SWOT analysis to uncover its multifaceted impact and potential for the post-pandemic educational landscape [1].
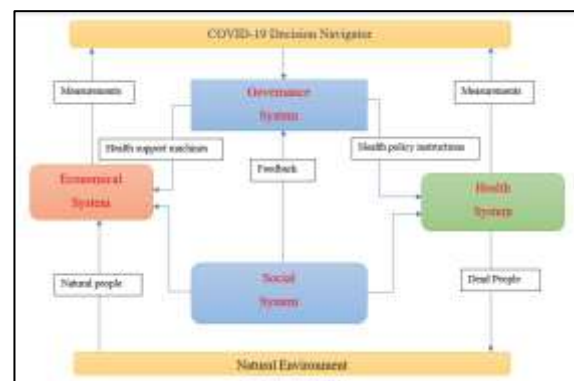


Figure 1: Flow of covid19 decision navigator

There are various impacts on the corona virus crisis in different categories of workers in the developing world, reveal disparities in employment disruption and recovery, particularly among women, youth, less educated

individuals, and urban laborers [2]. The corona virus triggered a swift transition to education, highlighting the importance of digital education infrastructure triggered a swift transition to online education. Research delves into assessing how the coronavirus pandemic has affected employee performance, specifically examining how technologies might moderate these effects.[3] post-COVID challenges include addressing educational inequalities, adapting to hybrid learning models, and supporting students' mental health.

The COVID-19 pandemic changes through online work trends, leading to a shift in job opportunities toward digital and remote roles [4]. The study aims to explore how digital learning initiatives have influenced student motivation amidst the challenges posed at coronavirus crisis, by looking the connection among digital education, students' motivation to learn.[7] The post-COVID job market places a premium on adaptability and digital skills, creating new opportunities while reshaping traditional employment landscapes.

The Employment sector has experienced a dramatic change from traditional work setup to remote work and digital advancements during the pandemic[6]. The consequences of these shifts explore how the employment sector has adjusted to these present circumstances and the challenges faced like redefined job roles, the growing gig economy, and the necessity for continuous upskilling and reskilling.[13]

Analyzing higher education's online shift, the emphasis lies in training lecturers, particularly in non-pedagogical fields. Continuous monitoring of student and lecturer satisfaction is pivotal[8], shaping a future of adaptable and enhanced online learning experiences within higher institutions.[15] COVID-19 prompted widespread lockdowns, reshaping job demands with a shift to remote work, notably increasing the demand for IT jobs, as revealed through data analysis comparing pre and post-pandemic work landscapes.[18]

During COVID, the educational shift from offline to online is examined using SORT analysis, evaluating pros and cons for both students and teachers[29]. The proposed "AHP-MARCOS" model aims to address issues and enhance post-pandemic education, employing diverse methodologies to identify and tackle problem-causing factors.[17]

Amid the COVID-19 lockdowns, a study gauges the Student Satisfactory Level for online teaching, aiming to identify subset issues through survey results for targeted improvements in the online education experience during the pandemic.[16] Focusing on job retention support tied to firm productivity, the research targets low-productivity firms for eligibility, advocating policies that reject job retention support, potentially impacting employment levels during the pandemic. It underscores the crucial role of job retention during challenging times.[19]
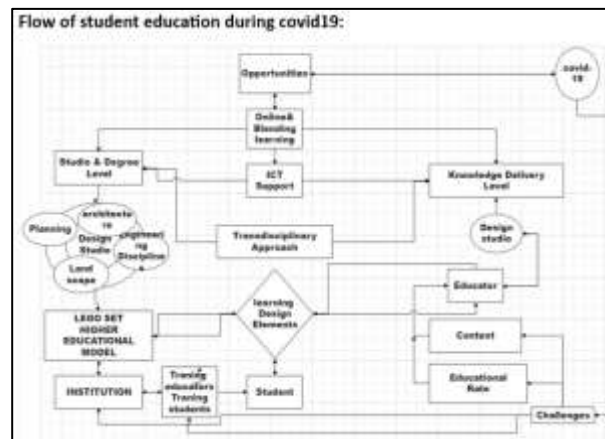


Figure 2: Flow of student education during covid19

Studies focusing on student satisfaction levels for online teaching and job retention support highlight the importance of targeted improvements in the online education experience and policies that support employment during challenging times.[9] Overall, the pandemic has accelerated digital transformations, emphasizing the need for adaptability, upskilling, and resilient educational and employment systems[10]. Industry 4.0 technologies play a crucial role in mitigating the pandemic's impact on work. The study explores their moderating effect on employee performance during the pandemic[11]. The digital shift in education and remote work trends has increased the demand for IT jobs, indicating a The employment sector has undergone a significant transformation, moving from traditional setups to remote work and digital advancements[5]. This shift has reshaped job roles, spurred the growth of the gig economy, upskilling and reskilling. reshaping of job demands and opportunities.

## II. LITERATURE SURVEY

A. *Title: Sustaining Higher Education through eLearning in Post Covid-19*
Authors: Ms. Hajar Mahfoodh, Ms. Hessa AlAtawi

This paper's main objective is to determine how eLearning helped with education at the time. eLearning helps economically as well as an educational resource during a pandemic. The paper implementation is done using SWOT analysis and discusses the positive and negative aspects of eLearning. Clearly explained strengths, weaknesses, opportunities, and threats.[1] Through eLearning, some students may understand or may not. eLearning helps to get more knowledge about digital culture and helps to grow economically. It also determines the issues of eLearning, like the lack of digital culture among students and educators.[21] The future scope of this paper includes expanding the success of eLearning into sectors such as medicine and science to enhance convenience and effectiveness.

B. *Title: Impact of COVID-19 on employee performance and the Moderating role of industry 4.0 technologies*
Authors: Gopalakrishnan Narayana Murthy, Guilherme Tortorella

This paper explains how COVID-19 affected employees' work and how new technologies (Industry 4.0) can help. A survey of 106 remote workers has taken and found that COVID-19 impacts work, but technology can improve performance, though it varies depending on the task and technology used, showcasing their potential in alleviating the pandemic's disruptions in the workplace [3] This showed that working from home improved employee performance, but job insecurity and virtual connections didn't have a direct impact and found that new technologies (Industry 4.0) can affect how well working from home improves output quality, but the people don't have a big impact on output delivery performance.[23]

*C. Title: Effect of Digital Learning on Student Motivation during Covid-19*

Authors: Ida Faridah, Febi Ratna Sari, Tri Wahyuningsih, Fitra Putri Oganda, Untung Rahardja

This research paper tells us about the impact which is due to eLearning on students motivation on studies and few researchers researched or observed that how student curriculum has affected because of virtual learning. The technology used is Digital Learning. In the end, a feedback is collected from students via a Google form with around 190 responses.[7] By analysing the data, concluded that students are more motivated by digital learning, and from the data obtained, there is an argument that digital learning incurs more expensive costs. So, a better solution is to be figured out so that it can be felt cheaper. In the future, more detailed research is needed to understand how digital learning affects students' motivation in education. This can be achieved by using modernized questionnaires and investigating other factors that might have a greater influence than digital learning.

*D. Title: Transforming a TBL Programming Class from Face-to-Face to Online Due to the COVID-19 Pandemic*

Authors: Joyce Lai, Connor Kesterson, Mohamed Y. Selim

The author has explained how the universities and colleges are being closed due to the pandemic because of the safety of students and faculty. Due to coronavirus crises, it explains how the selected course is transferred from offline to virtual and how eLearning has affected students.[9]. Based on the observations of performance and involvement of students over the course of the semester, the researchers found a significant impact of the initial phase, followed by a transition to treatment when classes shifted suddenly online.

*E. Title: The post-COVID-19 pandemic era: Changes in teaching and learning methods for management educators.*

Authors: Vanessa Ratten

This paper explains how coronavirus crisis greatly alter the nature of teaching management, with more focus on digital technology. However, there's still not enough research on how this change affects teaching and learning, so this article aims to fill that gap and answer questions about the future of management education.[4] There work recommends that their future investigations must concentrate on new theories, especially regarding the impact of the metaverse and artificial intelligence on management education. This paper offers practical suggestions for future research in management education, emphasizing the changes caused by COVID-19 and the shift toward digital learning.

*F. Title: The impact of the Covid-19 job retention support on employment*

Authors: Jaanika Meriküll, Alari Paulus

The research mainly looks at job retention support, which is based on the firm's productivity. Mainly the person who selected the low-productivity firms is eligible for job retention. The research mainly aims for the policy that rejects job retention support. It indirectly affects the employment levels at the time of the pandemic.[19] It also ensures that job retention is important at challenging times. Technologies used to improve productivity. Also found that the support program was effective in protecting jobs during the pandemic.

*G. Title: College Students Online Education Evaluation Through SWOT Analysis During COVID-19*

Authors: Haiyun Wang, Jiahui Wu, Muladi Muhedaner, Saniye Maihemuti

At the time of COVID, there were rapid changes in the educational sector where the education was changed from offline to online platforms [12]. So, the research refers that by using an evaluation swot method to comprehend the advantages and disadvantages on virtual learning from the perspective of the students and the teachers and gave suggestions to improve education in post-pandemic.[17] Also, different methodologies to find the problem-causing factors. Proposed a model "AHP-MARCOS" provides the victims or the students who don't face any problems. Technologies used are SWOT (Strengths, Weaknesses, Opportunities, and Threats), Cloud Method, Analytic Hierarchy Process, MCDM method, fuzzy AHP, and fuzzy MARCOS. Through the proposed model strengths, weaknesses, and threats of online education can be found.

*H. Title: An Efficient Data Mining Technique for Assessing Satisfaction Level With Online Learning for Higher Education Students During the COVID-19*

Authors: Hanan E. Abdelkader; Ahmed G.Gad

Amr A. Abohany, Shaymaa E. Soroure,

Due to coronavirus crisis , majority of countries moved into lockdown, and at those critical times, the education system has been continued by online teaching. So, authors tried to find out the Student Satisfactory Level for online teaching.[16] With the results of the survey, educators can get some set of subset problems that can improve or solve the problem of the students. With the help of the survey results authors can find the issues in online teaching. And with the above algorithms, their accuracy has been increased by 2 to 8 percent.[17] SSL

can also solve the problem at the early stage of online education.

I.  *Title: A New Pedagogy and Online Learning System on Pandemic COVID-19 Era at Islamic Higher Education*

Authors: Triyo Supriyatno, Facrul Kurniawan

The article's main purpose intended to analyze the consequences of coronavirus on Islamic Higher Education (IHE), Indonesia. Investigation is done to find approaches to online education in IHE and offers insights into the future of online education in the IHE system.[15] The recommendations include providing training in online teaching strategies for lecturers, especially those in nonteaching fields, and ensuring continuous monitoring of student and lecturer satisfaction with online education for data collection and improvement. Technologies used empirical methods and methods of theoretical analysis. It outlines essential recommendations for improving online higher education in Indonesia, such as training for lecturers, ongoing monitoring of satisfaction, and data accumulation.

J.  *Title: The impact of job crafting and work engagement on academic librarians before and during the COVID-19 pandemic*

Authors: Juliana M. Nykolaiszyn

Job crafting is when employees make changes to their tasks and work relationships to improve their job satisfaction. This research looked at how academic librarians in the US changed their jobs during COVID-19 and found that those who did job crafting and were engaged in their work were happier in their roles. Technologies used convergent parallel design to examine job crafting.[13] In summary, the conclusion points out that academic librarians adjusted their jobs, especially in specific tasks, and this positively influenced the work which was done by them did engagement, particularly at the time of coronavirus crisis.

Table 1: Literature review of different papers

| Sno | Paper title | Year of publication | Objective | Conclusion | Limitations |
|---|---|---|---|---|---|
| 1 | COVID-19 and management education: From pandemic to endemic | 2023 | Digital shift increased demand for jobs, indicating the employment sector has undergone a significant transformation. | As the pandemic shifts to an endemic phase, future management education research should build upon lessons learned | It does not focus on primary education. |
| 2 | The impact of job crafting and work engagement on academic librarians before and during the COVID-19 pandemic | 2023 | This research explores how academic librarians in the US adapted their roles during COVID-19 through job crafting. | In summary, the conclusion points out that academic librarians adjusted them. | It didn't use a random method. to select participants. |
| 3 | The post COVID-19 pandemic era: Changes in teaching and learning methods for management educators. | 2023 | In this paper explains how the novel coronavirus made changes in education works, with more focus on digital technology. | This paper discusses how education sector will make changes after novel coronavirus and answers two research questions about these changes. | The absence of empirical data or original research limits the depth and conclusiveness of the analysis on COVID-19's impact on management education. |
| 4 | Sustaining Higher Education through eLearning in Post Covid-19 | 2020 | This research mainly explore the objective how eLearning helps with education in the time. | Through eLearning, some students may understand or may not. eLearning helps to get more knowledge about digital culture. | It relies on previous studies and research without presenting original |

| | | | | empirical data or experiments. |
|---|---|---|---|---|
| 5 | Effect Digital Learning on Student Motivation during Covid-19 | 2020 | Tell us about negative impact of eLearning on students education motivation. | Here students are more motivated in digital learning and from the data obtain. | Predication of student motivation towards eLearning can't be done by conducting survey. |
| 6 | College Students Online Education Evaluation Through SWOT Analysis During COVID-19 | 2022 | To identify effective strategies for improving online education by using SWORT analysis. | Through the proposed model strengths and weaknesses have been found. | The data which is collected is based on the online questionnaires which do not cover the full range of the people. |
| 7 | An Efficient Data Mining Technique for Assessing Satisfaction Level With Online Learning for Higher Education Students During the COVID-19 | 2022 | To enhance the precision of prediction models for Student Satisfaction Level (SSL) for eLearning during coronavirus crises. | Can find issues in online teaching. . SSL can also solve the problem at the early stage of virtual learning. | This is only in the view of the student, but it should be from faculty side also. |
| 8 | Looking for Talent in Times of Crisis – The Impact of the Covid19Pandemic on Public Sector Job Openings | 2022 | Focusing on changes in job openings and the demand for various job types | How the public sector has faced the challenges and it revealed. planning uncertainty. | The data is taken from the single source which may not cover all the range of problems. |
| 9 | Learning during COVID-19 Pandemic: Online Education Community, based on Discord | 2020 | How discord has become primarily online education community for their college. | Using this technology, identification of a proper online platform is achieved. | It may have some technical issues and the Teachers must be given the training. |
| 10 | Impact of COVID-19 outbreak on employee performance – Moderating role of industry 4.0 base technologies | 2021 | Found that novel coronavirus impacts work, but technology can improve performance, though it varies depending on the task. | Industry 4.0 technologies minimally influenced output quality but had a limited effect on output delivery performance. | This research is the reliance on self-reported survey data, which may introduce response bias and limit the depth of insights. |

III. METHODOLOGY
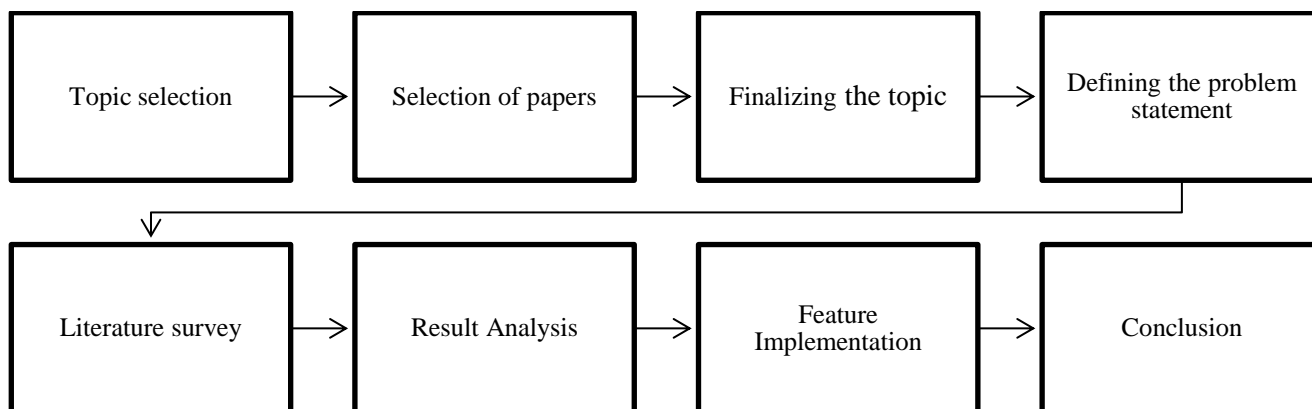
Figure 3: Flow of methodology

Initially, a list of potential research topics are collected, from which a specific subject is selected. Subsequently, a thorough research on the chosen topic is done and formulated a precise problem statement. Following this, an extensive literature survey has been done, engaging in discussions about the various outcomes presented in different research papers and identifying key elements for implementation in the future. Finally, a well-defined conclusion is synthesized to explore the future research.

## IV. DISCUSSIONS

### A. Disadvantages

Based on the above literature can identify some of the disadvantages that are there are limited focus on the primary education which impacts the younger students learning experience. Some of them also include lack of hands-on experience, the need for teacher training, unequal access to technology. These challenges are most important for equity and quality for a student to be evolve in the education.

### B. Advantages

Students can access prerecorded videos of what teachers covered during the online class if students miss the live session. E-learning also enables students to cut down on transportation expenses. E-learning minimizes barriers for students who might face challenges in commuting due to location, physical disabilities, or other limitations. It allows for broader access to education for a diverse range of learners.

### C. Scope of Improvement

To enhance this research paper, consider delving deeper into specific strategies for fostering digital culture among students and educators, analysing the long-term effects of online education, and exploring innovative solutions for job sector challenges during and post-pandemic.

### D. How to Improve

The post-COVID job market places a premium on adaptability To strengthen the research paper, delve into practical approaches for cultivating digital literacy among both students and educators. Additionally, expand the study to investigate the sustained impacts of online education, and propose inventive remedies to address job sector issues, ensuring relevance in both pandemic and post-pandemic scenarios and integrating emerging technologies for adaptability in pandemic and post-pandemic education.

### E. Evaluation Metrics

Most of the evaluation metrics is done on the limitations in primary education during the pandemic. Measure the significance of hands-on experience in online education and its implications for practical learning. Examine how the paper explores the enduring disruptions and challenges which impacted most on the educational sector assess the depth of analysis on this subject.

## V. CONCLUSION

The research paper can conclude that as the pandemic shifts to an endemic phase, future management education research should build upon lessons learned. The paper explores what are the strengths, weaknesses, and threats of online education. Through eLearning, some students may understand, or may not. It also determines the issues of eLearning, like the lack of digital culture among students and educators.

It discusses how the solution for the issues in online teaching is found. In the job sector, employees have faced trouble during the pandemic and have overcome the issues which are faced.

In summary, the research underscores the need for ongoing exploration and improvement in management education, drawing from the experiences and lessons from the global health crisis, particularly in the domain of virtual education and job sector.

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