Special Issue

a flagship journal with a focus on emerging issues

HORIZON JOURNALS
VOL. 2 (S) OCT. 2020

Life in Virtual World during COVID Lockdown: Issues and Challenges

HUMANITIES AND SOCIAL SCIENCES RESEARCH

Special Issue Editor: **Rabi Narayan Subudhi**, Ph.D.

Journal of Humanities and Social Sciences Research
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About the Journal

Overview

Horizon Journal of Humanities and Social Sciences Research (JHSSR) is an open-access journal published by BP Services, independently owned, dependent upon donations and run on a non-profit basis for the benefit of the world-wide social science community. It neither accepts nor commissions third party content. It is an open-access online scientific journal which is free of charge. It publishes the scientific outputs.

Recognized internationally as a leading peer-reviewed interdisciplinary journal devoted to the publication of original papers, it serves as a forum for practical approaches to improving quality in issues pertaining to social and behavioural sciences as well as the humanities.

JHSSR is currently a **bi-annual** (*July* and *December*) periodical that considers for publication original articles as per its scope. The journal publishes in **English** and it is open to authors around the world regardless of the nationality.

The Journal is available world-wide.

Aim and scope

Horizon Journal of Humanities and Social Sciences Research aims to develop as a pioneer journal for the social sciences with a focus on emerging issues pertaining to the social and behavioural sciences as well as the humanities.

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Abstracting and indexing of *Horizon*

As is the case with any new journal, indexing in all prestigious relevant databases takes some time.

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One author will need to be identified as the corresponding author, with their email address normally displayed in the article. Authors' affiliations are the affiliations where the research was conducted. If any of the named co-authors moves affiliation during the peer-review process, the new affiliation can be given as a footnote. Please note that no changes to affiliation can be made after your paper is accepted.

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Checklist for Manuscript Submission

- Cover letter
- Declaration form
- Referral form
- Manuscript structure

(Title, Author details and affiliation, Abstract, Keywords, etc. using the **IMRAD** style).

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1) Cover letter

Your cover letter should be complete and make a strong pitch. The cover letter should include all these details:

- Author(s): Full contact details (email, institutional address, telephone number, etc.) of all authors listed including who the corresponding author will be [full name(s) written as First Name then Last Name]. Understand the differences between lead author and co-author(s). Lead-author: who has done most of the research and writing; Co-author: Has collaborated with the lead author and contributed some parts.
- A brief explanation of your article's relevance and impact.
- Disclosure of whether you have published this study previously elsewhere or if it is in consideration by another journal.
- Disclosure of any commercial or financial relationship that may be viewed as any potential conflict of interest.
- A brief statement explaining why the journal should publish your study. (Refer to sample available at https://horizon-jhssr.com/download.php).

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The Journal's peer-review

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The Review process

What happens to a manuscript once it is submitted to *Horizon*? Typically, there are seven steps to the editorial review process:

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2. The chief executive editor sends the article-identifying information having been removed, to three reviewers. Typically, one of these is from the Journal's editorial board. Others are external specialists in the subject matter represented by the article. The chief executive editor requests them to complete the review in three weeks.

   Comments to authors are about the appropriateness and adequacy of the theoretical or conceptual framework, literature review, method, results and discussion, and conclusions. Reviewers often include suggestions for strengthening of the manuscript. Comments to the editor are in the nature of the significance of the work and its potential contribution to the literature.

3. The chief executive editor, in consultation with the Editor-in-Chief, examines the reviews and decides whether to reject the manuscript, invite the author(s) to revise and resubmit the manuscript, or seek additional reviews. Final acceptance or rejection rests with the Editor-in-Chief, who reserves the right to refuse any material for publication. In rare instances, the manuscript is accepted with almost no revision. Almost without exception, reviewers' comments (to the author) are forwarded to the author. If a revision is indicated, the editor provides guidelines for attending to the reviewers' suggestions and perhaps additional advice about revising the manuscript.

4. The authors decide whether and how to address the reviewers' comments and criticisms and the editor's concerns. The authors return a revised version of the paper to the chief executive editor along with specific information describing how they have answered' the concerns of the reviewers and the editor, usually in a tabular form. The author(s) may also submit a rebuttal if there is a need especially when the author disagrees with certain comments provided by reviewer(s).

5. The chief executive editor sends the revised paper out for re-review. Typically, at least one of the original reviewers will be asked to examine the article.

6. When the reviewers have completed their work, the chief executive editor in consultation with the editorial board and the Editor-in-Chief examine their comments and decide whether the paper is ready to be published, needs another round of revisions, or should be rejected.

7. If the decision is to accept, an acceptance letter is sent to all the author(s), the paper is sent to the Press. The article should appear in print in approximately three months.

The Publisher ensures that the paper adheres to the correct style (in-text citations, the reference list, and tables are typical areas of concern, clarity, and grammar). The authors are asked to respond to any minor queries by the Publisher. Following these corrections, page proofs are mailed to the corresponding authors for their final approval. At this point, **only essential changes are accepted**. Finally, the article appears in the pages of the Journal and is posted on-line.

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Horizon Journal of
HUMANITIES & SOCIAL SCIENCES RESEARCH

JHSSR

Vol. 2 (S) Oct. 2020

HORIZON JOURNALS

An international peer-reviewed scientific journal published by BP Services

Do not raise the bar unnecessarily by exaggerating requirements for successful publication, but rather encourage young researchers to try and experiment. Researchers can raise their ambition level through gained experience.

Journal of Humanities and Social Sciences Research
Vol. 2 (S) Oct. 2020

Contents

FOREWORD

Professor Nayan Kanwal, FRSA, ABIM, AMIS, Ph.D.
Chief Executive Editor, JHSSR

Welcome to the **Third Issue of 2020** of the Journal of Horizon Journal of Humanities and Social Sciences Research (JHSSR) focusing on COVID-19 concerns.

JHSSR is an academic, interdisciplinary, and peer-reviewed GOLD open-access publication, published rapidly by BP Services. The journal is independently owned, dependent upon donations and run on ***not-for-profit*** basis for the benefit of the world-wide social science community.

This issue features 12 articles consisting of a review article, opinion piece, and short-communication each, two concept articles and 7 regular articles from various authors that come across from different countries, namely **Bangladesh**, **India**, **Maldives**, **Nepal**, **Sri Lanka**, **UAE**, and **USA**.

I believe this issue would be intriguing, thought-provoking and useful in reaching new milestones. I would be grateful if you recommend the journal to your peers and students to make this endeavor more meaningful.

Being capable of publishing in peer-reviewed journals is commonly seen as an indicator of proper scientific research. It is the duty of a researcher to publish his results for the scientific community. Research can be seen as a product that must be sold to the target audience in the form of an article. In other words, research results do not exist before they are successfully published. The key people for getting one's article accepted for publication in a journal are usually the Editor-in-Chief, editor, and reviewers. After publication, a well-written article will attract readers, eventually resulting in a scientific impact defined by whether other scientists will cite the article.

In some cases, people raise the bar unnecessarily by exaggerating requirements for a successful publication. This may be either an intentional attempt to bring the game to a higher level, or merely unintentional. Unfortunately, it is difficult to improve the level before understanding the publishing process in the first place. Writing scientific journal articles is learned through writing and publishing attempts when constructive feedback is available. It may occasionally be possible to enter the big league of very high-level journals directly, but only with adequate levels of support and feedback. In other cases, it is possible to publish in increasingly better journals once gaining experience through more moderate publication mediums. A researcher can raise their ambition level through gained experience. Hence, it is equally important for any researcher to begin their publishing with new or young journals provided they are of good standing.

Learning to write journal articles is, however, not a black and white issue where there are absolute rights and wrongs. Being constructive is more important than seeking out flaws in the message. Young researchers should utilize several sources while building their know-how regarding scientific writing.

All the papers published in this special edition underwent the journal's stringent peer-review process involving a minimum of two reviewers comprising internal as well as external referees. This was to ensure that the quality of the papers justified the high ranking of the journal, which hopes to be one at par with one of the renowned and heavily-cited journal not only by authors and researchers in Malaysia and America but by those in other countries around the world as well.

I would also like to express gratitude to all the contributors who have made this issue possible, as well as the authors, reviewers and editors for their professional contribution. Last but not least, the assistance of the journal's editorial office in Texas is fully appreciated.

Horizon JHSSR is currently accepting manuscripts for upcoming issues based on original qualitative or quantitative research that opens new areas of inquiry and investigation.

The editors hope that the authors publishing in this journal can support the noble cause of Horizon in reaching its goals.

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October, 2020.

ISSN 2682-9096 Online
PUBLISHED: 2020-10-15.

PREFACE

Professor Rabi Narayan Subudhi, Ph.D.
Guest Editor, JHSSR

This special issue is the outcome of an international Conference organised jointly by KIIT University, Bhubaneswar, India, Operational Research Society of India (ORSI), Bhubaneswar chapter and ICSSR – IMPRESS project of KSoM, KIIT, on a theme, "The '**new-normal' life in virtual world: Issues, Challenges & Way forward**", held on June 28, 2020, on digital platform.

It was attended by over 350 delegates, from 7 countries, where 28 research papers and 12 invited talks were presented. Subject experts had affiliation from leading Universities and Institutes of India, Nepal, Bangladesh, UAE, Sri Lanka, Maldives and the USA.

The Conference covered the issue of 'effectiveness and impact of 'Digital Medium' on 'digital-life', particularly during the COVID-19 lockdown, in all fields, business, academics or social networking. It was research based 'experience sharing' by the 'stake-holders', to understand the issues relating to the 'virtual life', in this 'different' virtual-world, 'working from home' (WFH) during lockdown. Along with experts and researchers, concerned stakeholders, like, examinees, examiners, and the service providers, who attended this conference.

Out of 26 research papers, presented during the conference, only top 12 papers were selected based on their merit. All these selected papers had undergone stringent and rigorous peer review process involving a series of reviews by both internal, external reviewers as well as from the prestigious Horizon journal.

We would like to thank all our esteemed contributors, as well as the reviewers for their commitment and patience, which had made the publication of this special issue possible. We sincerely hope that the articles published in this issue will be of great academic help to all the researchers, working in related areas, in expanding their knowledge and in publishing more articles of higher quality and standard.

We would also like to thank Editor-in-chief, Chief Executive Editor, Professor Nayan Kanwal and other editorial and production team members of Horizon Journal, for their trust and support and for their tremendous efforts and dedication to improve the quality of the articles published in this issue. We also thank Horizon journal editorial board for supporting the conference, since its conceptualization and also for publishing first the 'Book of Abstracts' of all papers, at the time of conference.

Guest Editor
Rabi Narayan Subudhi, Ph.D.
October 2020

Published by BP Services, eISSN.2682-9096 | **DOI:** https://doi.org/10.37534/bp.jhssr.2020.v2.nS.id0001.p3

Horizon J. Hum. & Soc. Sci. 2 (S): 5 – 10 (2020)

Journal of Humanities and Social Sciences Research
www.horizon-JHSSR.com

REVIEW

Emerging Trends of Emergency Remote Education in COVID-19: A Thematic Literature Review

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ARTICLE INFO

Article history
Received: 26-Jun-20
Revised: 25-Sep-20
Accepted: 29-Sep-20
Published: 15-Oct-20

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ABSTRACT

The emergence of Pandemic has led to closing of schools and colleges world over leading to sudden disruption of education for millions of students and teachers across the globe. The students and teachers have suddenly been forced to adopt online teaching. In this scenario, a lot of thematic trends in online education is emerging such as blended learning, mobile education etc. This paper tries to find some the thematic trends, emerging world over education sector, and summarized the finding in the paper.

The blended learning with appropriate stakeholder management with collective responsibility with the use of new age technologies has emerged as common trend all over education community as summarized by our findings.

Keywords: E-learning, Blended learning, Mobile education, Covied-19, Comparative, School Leadership, Student Autonomy.

Introduction

Integration of web technology into education/learning

Definitions of distance learning, online learning and e-learning environments vary across geographies (J. L. Moore et al., 2011). Different studies have been carried out over the years to understand the integration of web technology into education; factors affecting teaching effectiveness in online mode (Volery, 2001), learning outcome improvement due to web-based technology (P. S. D. Chen et al., 2010), improvement in enrollment and access to education due to online mode of classes (Goodman et al., 2019), evolving trends of e-learning (Choudhury & Pattnaik, 2020).

Methodology

We have analyzed over 100 Scopus indexed papers from various databases such as Emerald, Web of Science to find out the thematic emergence of education during the Covid-19 lock down period.

Literature Review

Student engagement in different learning environments

Based on various research findings, it has been postulated that different learning environment will have different level of student engagements and learning outcomes; satisfaction in short-duration and long-duration online courses (Ferguson & Defelice, 2010), comparison between classroom and online mode based on learning styles and outcome (Brau et al., 2017; Callister & Love, 2016; Clayton et al., 2010; A. Driscoll et al., 2012; Emerson & MacKay, 2011; Fadol et al., 2018; Kemp, 2020; Tang, 2013; Tseng, 2016) and based on learning preference (Aragon et al., 2010; Barnes, 2017; Butler & Pinto-Zipp, 2005; Hagel & Shaw, 2010; Marquis & Ghosh, 2017; Nollenberger, 2015; Rovai & Grooms, 2004), fairness of

 DOI: https://doi.org/10.37534/bp.jhssr.2020.v2.nS.id1069.p5

assessment in different course modes (Hewson, 2012), characteristics difference in low and high achieving students in classroom and online mode learning context (Fendler et al., 2016), difference in learning satisfaction between new and existing learners in online mode (Li et al., 2017), difference of learning outcomes based on Myers-Briggs Indicator of personality (Boghikian-Whitby & Mortagy, 2016) and big five model (Rios, 2019), based on asynchronous and synchronous online modality of teaching (Sharifrazi & Stone, 2019), hybrid model of teaching outperforming online and face to face modality of teaching. (Swanson & Swanson, 2019).

Researchers have looked into factors for online course abandonment (Lee & Choi, 2011). Further Rogers et al. (2018) studied the online class expectations and deterrents for the faculties taking online classes.

Emergency remote (online) education mode during COVID-19

The prevailing COVID-19 pandemic scenario has put all educational institutes to adopt remote (online) education mode on an emergency basis as uncertainty looms over on the prospect of when regular classes can get started across geographies. The practices to be adopted in the emergency remote (online) education mode need to different from already existing practices of online education. (Bozkurt et al., 2020).

In this context, various researchers have looked into dynamics of emergency remote (online) education mode; need of revamping online pedagogy (Bhaumik & Priyadarshini, 2020), adoptive pedagogy design options (Lynch, 2020), adoption of innovative technology (Major, 2020). Also impact of suddenly switching to online mode have been studied; increase in academic stress (Moawad, 2020).

Results and Analysis

Following trends have emerged during Covid-19 which are summarized below

1) Blended Learning

Blended learning as a concept has gained currency recently. In simple terms, it means a holistic approach towards teaching which includes face to face classroom interaction, mentoring, projects and online assignments among other things (Bonk et al., 2005).

In recent times this gained additional currency since, blended learning has proved to be successful in reducing geographical and transactional distance (M. G. Moore, 1993). The transactional distance can be understood in term of distance in communication and leaning space between the teacher and the students (Giossos et al., 2009).

Thus, blended learning according to researchers have reduced the gap in learning and thus, have greater probability in ensuring the success of the students (Oliver & Trigwell, 2005).

Accordingly, the blended model (Norberg, 2017) during pandemic has four different themes

1. The Face to Face Blended learning that entails the learning within the four walls of classroom with teacher and student physically present at the same time
2. The Self-paced learning which can be facilitated by the educational platforms which have leaning material for the students to grasp and self-pace at suitable speed
3. The Tele-communication which entails modes of mass communication for educational purposes such Gyan Darshan etc.
4. Ubiquitous learning that comprises self-paced courses available at platforms like MOOCs (Massive Open Online Courses)

With respect to Blended learning during the COVID 19 time, one must also be aware of education in these two contexts (Hwang, 2014)

1. Classroom context when learning environment is teachers leading / facilitating the learning
2. Personal context when the students undertake self-paced learning. The thematic approach should be to close in the gap between the two contexts as much as possible

The blended leaning has also used different felicitation models for students such as

1. Flipped classrooms, (Suo & Shi, 2008)
2. Web based learnings, (M. Driscoll, 2010)
3. Distance learning, (Cockrum, 2017)
4. E-Learning, (Suo & Shi, 2008)

5. Pervasive process leaning, (Altamimi & Ramadan, 2016)
6. Learning management system (Moskal et al., 2013)

2) Access and availability to E-Resources

The emergence of single learning theory during Covid-19 is essential (K.-C. Chen, 2007). This ensures all the stakeholders in the model are on same page. There are different viewpoints on the importance of technology of delivery or the contents of the learning that is supposed to be most important (Beynon, 2007).

One school of thought places prominent emphasis on instructional delivery strategies in terms of classroom material to be shared (Clark, 1994), the projects and assignment to be submitted while other school of thought prominently places technology of education at a higher level (Kozma, 2001).

It takes into consideration the stakeholders (Mayer & Moreno, 2003)

1. Course content
2. Co learners
3. Course Instructors

3) Stakeholder theory in distance education

Technological platforms are being used to lay theoretical foundations of cognitive skills in the students. (Mungai, n.d.) This has become especially useful during pandemic which has forced millions across the world to adopt new and innovative technologies to overcome learning curve in a very short span of time.

The various parties in model e-leaning (Johnson et al., 2008; Zhang et al., 2014) can be summarized as

1. Learners / Students
2. Instructors/ Faculties / Teachers
3. Developers (Content)
4. Various accretion bodies
5. Employees or office Administrators
6. Educational Institutes
7. Technology Providers

These are further classified to leaners (students), instructors, designers and executors (implementers) (Amit & Zott, 2001; Berge, 1995; Wagner et al., 2008).

Analysis

The design principles of E–Education

In an extensive study (Hall et al., 2020) undertaken over six countries (UK, Australia, Cyprus, Ireland, The Netherlands and Belgium) based on the four years study to find out 21 designs principles under DEIMP (Designing and Evaluating Innovative Mobile Pedagogies) project have identified five major areas to give the most emphasis on:

1. Collaboration – Teamwork for grater synergy and workmanship
2. Adaptive – Evolving and changing according to needs
3. Mobility – Seamless transition on different platforms
4. Student Choice – Giving priority to student autonomy
5. Authenticity – Authentic tools and environment to felicitate the leaning

Conclusion

What is very self-evident is the fact that there can be no student wellbeing without teacher wellbeing (Hargreaves & O'Connor, 2018). Hence the need of the hour is to balance the need of all the stakeholders. This calls for effective professional collaborative approach with multidisciplinary team serving multiversity set of students (Shirley et al., 2020).

Ensuring emotional support to teachers, faculties by leadership management is absolutely crucial as a way forward along with transparency, openness and collective shared organizational goals (Solvason & Kington, 2019). The students and the teachers will prosper in an environment of common moral ground with shared responsibility (Hargreaves et al., 2018).

Competing Interest Statement

All authors have read and approved the manuscript and take full responsibility for its contents. No potential conflict of interest was reported by the author(s).

Acknowledgements

The authors would like to thank the reviewers and editors of this manuscript.

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Horizon J. Hum. & Soc. Sci. 2 (S): 11 – 16 (2020)

Journal of Humanities and Social Sciences Research
www.horizon-JHSSR.com

OPINION

Academic Challenges and Opportunities during the 2020 Pandemic

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ARTICLE INFO

Article history

Received: 26-Jun-20
Revised: 25-Sep-20
Accepted: 29-Sep-20
Published: 15-Oct-20

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ABSTRACT

The 2019 Novel Coronavirus pandemic substantially affects economics, social health, and education. Colleges and universities could face potential losses to their normal enrollment numbers. The pandemic forced instructors and students, who were comfortable with traditional face-to-face classrooms, to experience online classes, some for the first time. Research has shown that online classes are not as effective as in-person classes. In this study, hybrid classes are suggested as a solution to decrease the cost of reopening schools: providing personal protective equipment (PPE) for faculty and staff, and the need to sanitize facilities and classrooms thoroughly and repeatedly each day. From hybrid classes, active learning that might not be achieved from online classes could be experienced in regular classrooms. They can allow students to balance their course work and their regular life responsibilities and help them to avoid isolation that can occur in online classes.

Keywords: Online-classes, In-person class, Hybrid classes, COVID-19 pandemic, Global village.

Introduction

Throughout the written history, there were many severe pandemics that affected human life. Some of these pandemics are well-known: the Black Death during 1346 to 1353 with 75 to 200 million deaths [1], the Spanish flu between 1918 to 1920 with 50 million deaths [2], and the AIDS epidemic since 1981 to present with 36 million deaths [3]. The earlier pandemics did not have the ability to travel as they might today; there was no airline industry in 1918-1920 and long-distance transportation could only be conducted via cars and ships, however, the Spanish flu killed around 25 million people in the first 25 weeks of the pandemic, and overall, 500 million people were infected [2]. Today, the 2019 Novel Coronavirus (COVID-19) pandemic has caused around 450K deaths and is nowhere near extinct. With lessons of the past in mind and the modern international community aware of the potentially devastating effects of pandemics, there is one vital question about our current situation: were we ready for the COVID-19 pandemic?

As the world continues to monitor the ongoing effects of the pandemic, is it clear that education has also been greatly affected by the COVID-19 virus. Schools in 185 countries are closed and most classes are being held online [4]. Concerns have increased about the mental health stability of students in the long run as well as academic metrics. In a short period of time, instructors and students had to adapt their skills to the new pandemic environment. Although online classes have been developed in recent years, a lack of available tools and advanced software is still problematic in every country. Difficulty accessing to internet, requiring the electronic devices, and limited software availability are clearly enormous challenges in current education. Media and TV classes could be a solution to continue online teaching. However, how to engage students with class materials, how to explore active learning, how to adapt online learning skills for real-life environments, and how to assess students efficiently are still the predominant challenges for the education industry.

Most instructors around the world now have a minimum experience in online teaching. Instructors in every level have now adapted their skills with new generated software and electronic devices. A lot of ideas and methods were discussed and shared from one instructor to another. These experiments could be considered as an opportunity to enhance the efficiency of education. In this study, it is suggested that hybrid classes, that is, a combination of online and in-person classes in one course, could be considered as an opportunity to achieve the goals of education and prepare students for future real-life challenges.

The rest of this study is organized in 6 sections. The next section illustrates the lack of preparation for a pandemic. In the third section, pros and cons of online and in-person classes are discussed. A personal experience is demonstrated in section 4. Section 5 illustrates that hybrid classes should be considered to enhance education both during the pandemic and in the post-pandemic educational environment, and the paper is concluded in section 6.

Lack of preparation

The study of the COVID-19 pandemic shows that we were not ready for any pandemic. Even developed countries were struggling and are still fighting to find possible approaches to manage economics and industries. Millions of people are actively trying to survive, find first-aid requirements and stay safe. The USA federal government implemented a $3 trillion coronavirus stimulus bill to support the USA economy [5]. From this aid, global markets are starting to recover [6]. However, more than one third of American workers are still unemployed [7].

There are numerous articles about global warming and natural disasters. Conferences and seminars are organized to address the importance of paying attention to these issues. Theories and models are developed to estimate and forecast global warming affects. Variety lessons have been planned to educate people in different age groups and to prepare people to stay safe during an earthquake or a tornado. Students are taught the necessary steps to take when a flood, hurricane, or volcano occurs. Since the term *Global Village* was introduced by McLuhan 1962 [8-9], there have been several pandemics, such as AIDS (1981-present day), H1N1 Swine Flu (2009-2010), Ebola (2014-2016), Zika virus (2015-present day), and the COVID-19 virus. As the entire world becomes more connected though a shared challenge, the disease clearly spreads faster, and the effects of such a pandemic become increasingly disastrous. With all the previous examples available, shouldn't we have developed lessons, conferences, and models to learn how to deal with a pandemic before COVID-19?

Our communities are constantly reminded that "safety is important", that is, being prepared to decrease the risk of an accident and possible prevention of a disaster is vital. Have people been educated to follow a similar safety plan to decrease the spread of a virus? The World Health Organization (WHO) suggested that wearing medical masks can indeed prevent the spread of the COVID-19 virus [11]. However, according to the New York Times [10] even police officers are rarely wearing masks to protect themselves and others during the COVID-19 pandemic. Was following such a safety plan not part of their training? Could safety now get attention in education to decrease the risk of future pandemics? To prepare for a less disastrous future, it seems it must be a considered change.

Online and in-person classes

The available studies show that online classes are less productive in comparison with regular face-to-face classes [12]. During a class, students are naturally engaged with the content and shared materials, can see other students and their motivations, can discuss a problem and the way of solving the problem in face-to-face group activities, can learn educational behavior from their instructors, and can increase their social behaviors and their awareness of diversity.

Protecting tests and exams, academic integrity, and preparing a fair environment for every student during a test, are main concerns in the educational industry. Even for in-person exams, there are a number of academic integrities violations each semester. Online testing and exams, in contrast, would not be effective for both students and educational purposes. From one side, students can use multiple sources to find solutions without thinking and developing their skills. For example, the CHEGG website [13] is designed to solve homework and get step-by-step solutions 24/7 in less than 30 minutes on average. There are plenty of apps [14] such as PHOTOMATH, that one can use to get a step-by-step solution to solve a mathematical problem just by taking a shot screen or a picture of that problem. Even with 360-degree cameras (which is impossible to provide for every student and in every environment) there are still numerous ways that one can get around an exam. In contrast, there are many methods that instructors can use to decrease the

violation of academic integrity, but at the same time, each way could increase the stress level of students. For example, not all students have enough bandwidth or internet connections, and not all students can afford electronic devices that are suitable for testing. From both sides, the results of online tests or exams would not be useful to explore the knowledge of students, and several adjustments should be considered to make sure that a fair environment is provided for all students.

On the other hand, colleges and universities are facing many significant risks in their struggle to remain open. Many universities financially depend on the number of students' registrations and tuition fees. Reopening schools, virus testing students, staff and faculty, and conducting complete classroom sanitation several times a day, increase costs substantially. Research estimates that a weekly virus testing for faculty, staff, and students just for the University of California would be US$1 billion a year [15].

As a result, from one side, online classes can be ineffective to prepare students to deal with future life challenges, and from another side, in-person classes can increase the risk to students' health and the costs of education. It is not unreasonable to anticipate that the educational skills achieved during this time would not effectively be as high as those of the pre-pandemic era. There is a need to schedule several plans to restore the loss quality of education for the post-pandemic time. With this aim, some universities (for example, Michigan State University) are going to offer hybrid-classes, that is, a part of class is held online and a part in-person. For example, one third of classes can be in person during a week. From hybrid classes, both the educational cost and the quality loss of education are decreased.

Personal experience

The COVID-19 pandemic occurred at the middle of the Spring 2020 semester. In the first half, classes were held in-person and the other half online. Before the pandemic, for my Probability class, I taught lessons on an iPad during class, instead of using the white board. I could record all the notes that I was writing during class and then share them on Canvas [16] for students' review. I found this method effective, as (a) I had a record of all my notes and the shared materials during class, (b) students could review their own notes and check with the shared notes to see if they missed any part, (c) students could ask questions after class on a specific part of the notes, (d) students who were absent could still access the class notes, and (e) I could review the notes, copy and paste a table and a graph, use several colors, undo a part, and correct any unclear section during and even after the class. As a result, my way of teaching was almost the same before and during the pandemic and it was also convenient for students to follow my lessons and adapt to course materials. The only differences were the change in environment and online classes versus in-person classes. I gave two exams to students in each half of the semester. My pre-pandemic exams were closed-notes and closed-books with no electronic devices, no calculators except a very basic calculator, and included 5 written response questions within 50 minutes. The exams during the pandemic were online, open notes and books, and students could use internet, any type of calculator and software, but there was a limited time, a large number of questions, they could only see one question at a time, and some questions required writing the final solutions only and some required uploading a step-by-step handwritten written solution response. Students were randomly grouped to have different types of questions or the same questions, but the questions were sorted in different order for each student. Students were required to solve as many questions as possible in 50 minutes. The best achieved score was considered as 100% and the rest of the scores were relatively calculated. Students had to connect to a Zoom meeting to get a code to start their exams. Breakout rooms were utilized to assign each individual into one particular room. This allowed students to ask their possible questions during the exam without distracting others. No camera was required. To decrease the stress level of exams in both situations, sets of questions and homework were also provided before the exams for students. Some of the questions were solved during class and some were left for students to practice. A similar style to select questions was considered for exams before and during the pandemic. Questions which were solved during lessons were also considered for exams and, for some questions, the numbers were not changed, that is, exactly the same questions that had been shared previously were used in exams. Students who had the highest score before the pandemic still had the highest scores during the pandemic and it was the same for students with the lowest scores. However, I found that the students' problem solving skills were worse. It is worth mentioning that a relative score was assigned for the exam during the pandemic, whereas the pre-pandemic exam was scored from a constant number. The important issue is that most students could solve 3.5 questions correctly on average pre-pandemic but could only solve two questions correctly on average during the pandemic online class period. A very few students could attempt and solve the questions that had already been shared and

provided for student practice. My experience supports the outcomes in recent studies [12] that online classes are not as effective as in-person classes.

Hybrid classes

Hybrid classes can be a reasonable solution in this pandemic. The hybrid design provides the best learning opportunities to experience both in-person learning and online digital learning. Teaching for some courses such as engineering, chemistry, biology can be held online while practicing and lab activities can be conducted in labs or classrooms. Other courses such as mathematics and statistics can be taught in classrooms and the activities and applications can be performed online. The online part of hybrid classes helps students to practice their basic time management skills, improve their keyboarding skill, become familiar with related software and technologies, and decrease transportation costs. Of course, a fast bandwidth Internet connection is required to achieve expectations. The in-person section of hybrid classes helps students to work on their communication skills, experience real-world situations, and build their network and friendships. Overall, from hybrid classes, students can balance between their coursework and their regular life responsibilities, avoid the potential isolation that occurs in exclusively online classes, and experience face-to-face interaction as part of their community [17]. From hybrid courses, the number of classes during a day can be decreased such that one third are in-person and the rest are online. For each course, one, two or three classes are normally scheduled within a week. For a course that required one class a week, the in-person classes can be scheduled every other week. For a course with two classes a week, one class can be conducted online and the other in-person. For a course with three classes a week, either classes can be merged into two classes as discussed, or one class can be arranged in-person and the other two held online.

Conclusion

COVID-19 is not the first pandemic in history, and it is hard to believe that it will be the last. It is vital that we prepare for unexpected situations and educate new generations to be ready for future life challenges. Hybrid classes could be a solution during pandemics to sustain the learning process and support social interactions. For mathematics and statistic courses, teaching could be held in-person and practicing skills, completing homework, and performing pair and group activities could be accomplished online. Engineering courses could be taught online, and the lab activities could be planned in-person.

The needs of developing user-friendly software, extending the bandwidth and speed of internet globally, providing electronic devices for both instructors and students, and designing suitable rooms for online and hybrid courses are now essential tasks for current and future educational development.

Competing Interest Statement

The author has read and approved the manuscript and takes full responsibility for its contents. No potential conflict of interest was reported by the author.

Acknowledgements

The author would like to thank the reviewers and editors of this manuscript.

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Horizon J. Hum. & Soc. Sci. 2 (S): 17 – 22 (2020)

Journal of Humanities and Social Sciences Research
www.horizon-JHSSR.com

SHORT COMMUNICATION

Getting Acquainted with Virtual Reality

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ARTICLE INFO

Article history

Received: 26-Jun-20
Revised: 25-Sep-20
Accepted: 29-Sep-20
Published: 15-Oct-20

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ABSTRACT

The overall purpose of the paper is to find out the effectiveness of using internet as a mode of operation in our daily lives since the lockdown. It discusses the possible factors that can have an impact on the effectiveness of this process of using internet as a platform for work; how are we going to adapt to the new normalcy and the way forward. It includes a qualitative and quantitative analysis of how productive people feel using internet for work/studies. The analysis is confined to a sample size of 144 respondents who are a representative to a larger population falling under a wide age group starting from school going students to people in their late 50s who had to take a lot of pain to adjust to the new normalcy. The analysis shows that apart from the obvious reasons affecting people's productivity, working for longer hours and information overload are the two most significant factors that hampers the effectiveness of internet as a mode of operation in Work from home and Online Classes respectively. The analysis reaches to a conclusion where students/working people have to find out possible ways in which they adjust to the situation, now that going back to the traditional way of living lives and working seems challenging. The desirable solution going forward is the existence and adaptation of a world which is a perfect amalgamation of both physical and virtual spaces.

Keywords*:* Productivity, Information Overload, Longer Working Hours, Online Classes, Work from Home.

Introduction

The lockdown in India which was declared on 25th of March has severely affected not only economic sectors but lives as well. From people getting to into self-isolation to markets crashing; there are many challenges in the road ahead and this paper will focus on the effectiveness of using internet as a mode of operation in our daily life. The research done in this perspective has been designed to study the effectiveness of using the internet for online classes as well as for work from home. The sample size for the survey is 140 and will discuss factors like if the medium of operation via internet has been effective compared to the pre-lockdown times and if not what are the challenges and what is the way forward.

How are times going to look ahead is the question that needs to be answered? The only way to be able to pull of this pandemic and still support lives of billions of people in this country is to shift the way business work and keep up with our mental health. Since, the pandemic won't allow business and industries to work the usual way, there is great potential for business in the digital medium. The only good that the pandemic has done is shoot up the shares of the telecommunications industry. Now the main aim of all the economic sectors should be use this opportunity to keep their business alive. Business must go back to old era now- Producing local. Since the pandemic has hit the world and disrupted the global supply chain, businesses must not wait to withdraw themselves to depend on it and rather

find a way to build supply chains domestically. It will not only revive business but also bring up job opportunities for millions of people in the informal economic sector. The digital sector which is now on the fast-forward mode can give birth to potential job opportunities in fields of cloud computing, cyber securities and data analytics. Business that see less opportunities going digital must now conserve cash to self-sustain. Networking and co-operating will be key for businesses to grow collectively. Businesses that work online can help small business to grow by delivering their products to the customers. This is not only keep the network of businesses alive but also employ people bringing ample amount of Job Opportunities. The real challenge that this pandemic has brought in is to do business differently that will sustain lives and livelihoods. India has a great potential to be the next hub for global supply chain after China. This opportunity if used properly will surely recover all the losses that the pandemic has caused.

Literature review

With the offset of COVID-19 Pandemic a lot has changed around us. Keeping aside the gloomy facts of the pandemic, it is important to dig deep and takes benefits of the situation. Statistics of Bloomberg says that Indian's consumption of internet has increased by 13 % since the lock down and the average daily consumption of data rose to 308 Petabytes (308000 Terabytes). Out of 60 crores internet users, around 29 crores are in rural India. According to a report by Common Services Centre, the Internet consumption of rural India has seen a jump of nearly 100 percent during the lockdown with an average daily consumption of 4.7 Terabytes of data. Besides that, there has been a high demand of Fiber to Home Service in rural homes. These data clearly indicate the high appetite for internet services in India. [1]

The Ministry of Electronics and Information Technology under the leadership of Prime Minister Narendra Modi launched the Digital India campaign back in 2015, with a vision to improve the online infrastructure of India aiming to cater to its citizen for various digital services and to also connect the rural India with high speed internet services and support digital literacy.

While the campaign portrays itself to bring reforms, it seems to have fallen behind its schedule. Learning the potential internet usage of India, there is no better time than this, to accelerate the Digital India campaign. While there seems no effective way to boost the tumbling economy, the skyrocketing internet usage patterns of Indians hold a great potential to push the economy up using Internet as a mode to work.[2]

The pandemic has mostly disrupted all the industries and internet can be the lifeblood to help them survive. India's economy is majorly categorized into industries like the Agricultural Industry, the manufacturing Industry and the Service Industry. While the service industry has an advantage of working on the internet, the other two are unlikely to be able to use it to profitable work. The manufacturing sector runs because for workers. Because there is a shortage of workers after they have migrated back to their homes, the manufacturing industry doesn't really seem to be taking off. The agricultural industry will be doing fine since the situation gives the farmers extra helping hands now that their relatives have returned home. But the scope of usage of internet for productivity in this sector is also unlikely. The only industry that can take the maximum benefits of Internet to work is the Service industry. Under the service sector, business activities, hospitality have surely slowed down because of dropping demand, but the sectors that have performed really well are the Telecomm sectors, the IT and the pharmaceutical sector. Out of these internet has definitely been the reason that has pushed the IT sector because of work from home advantage and telecomm nation sectors have also benefitted because of the increase internet usage.

Discussion

From the various issues that can fall under the discussion of the effectiveness of using internet as a mode of operation, the most valuable and convenient point of discussion in this particular paper is the effectiveness of using internet as a mode of operation for online classes and work from home situation.

The population for this particular research model would be wide from school going students to people at their late 50s who have taken a lot of pain to be able to cope up with the virtual work mode. But the sample is confined to 144 respondents in the same age group of the population who were convenient to approach.

The research model focuses on judging the effectiveness of using internet as a mode of operation for online classes and work from home. Effectiveness is mostly how productive one feels on these platforms compared to the pre-lockdown times. Hence, the model studies different potential factors that can affect the productivity of people on shifting to using internet as a mode of communication.

It is obvious that in the past three months we have felt numerous issues while studying or working. We have all struggled with keeping up with our work given there are notifications from social media handles, there have been comparatively longer hours of work due to easier accessibility; that also leads to too much information to store and analyses in our brains. The list of the issues just goes on.

Hence after analyzing all the issues these are some factors that are most potential to be affecting productivity on the internet as a mode of operation

- *Social media distraction*
- *Poor internet connectivity*
- *Psychological isolation and monotonous life*
- *Salary cuts*
- *Distractions at home*
- *Longer working hours*
- *Procrastination*
- *Ineffective communication*
- *No clarity on subject matter*

From the table we find that 'Information Overload' is a significant factor at 95 % Confidence level on why students are feeling less productive. It is true that during the lockdown, students are being constantly fed with tasks and there is just so many courses to grab on to add to their knowledge bag. When information keeps flowing in there definitely exists high chances of diverting focus onto many things and ending up doing nothing.

Heading straight on to people who took Online Classes

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept	2.411063	0.511004	4.718282	2.64E–05
[Social Media distractions]	–0.078121	0.105411	–0.741113	0.462749
[Poor Internet connectivity]	0.163811	0.120699	1.357189	0.18197
[Psychological Isolation and monotonous life]	–0.098976	0.142583	-0.694166	0.4914
[Information Overload]	0.389752	0.149559	2.606004	0.012621
[Distractions at home/Improper working environment]	0.164792	0.196416	0.838992	0.406224
[Procrastination of assignments/projects because of improper supervision]	0.046023	0.113238	0.406432	0.686489
[Being unable to understand the subject matter taught]	–0.367158	0.183716	–1.998512	0.052162
[Irregular Class Timings]	–0.01392	0.155449	–0.089544	0.929075
[Ineffective Communication with classmates and teachers]	–0.133697	0.140302	–0.952923	0.346081

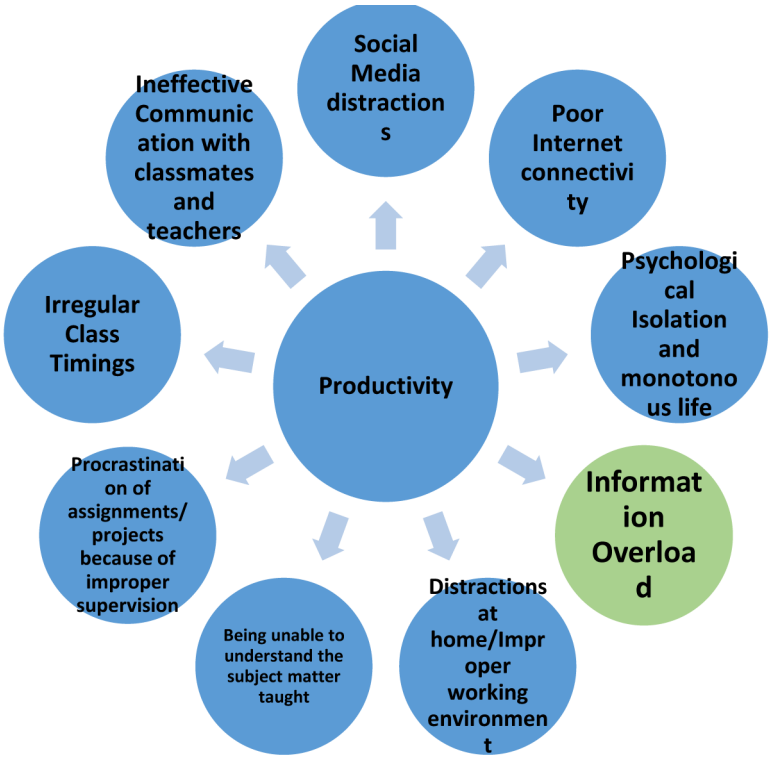

Figure 1: Representation of factors affecting productivity in Online Classes

From the Table we see that 'Working for Longer hours' makes people feel less productive. The work from home culture doesn't have the limit to work in a confined time slot. And since the economy is tumbling there are many firms which are pushing their employ to the peak of performance which makes them work being occupied for almost the whole day. The human body needs change of environment and break to perform at its best and in situations like this, working for longer hours definitely is a significant factor to reduce productivity.

Conclusion

The analysis showed that there are significantly two factors that affect productivity for people during the lockdown. Since the sample size is confined to just 144 people there obviously are other factors that must be affecting productivity of people during the lockdown. Social Media distractions and poor internet connectivity should not be ignored as well. There are many people who are still struggling to keep up with the online platforms because of poor internet connectivity and there are reports which show the usage of social media to have increased to 4 hours and 39 minutes per day during the lockdown. So, if on an average a person spends close to 5 hours on social media it definitely is one of the factors why he/she is not able to deliver the best for work/ studies. Other factors like poor Internet Connectivity also might be significant in such cases. There are still many who can't afford a smart phone or a data pack. It is clear and obvious the research has no boundaries and the factors affecting productivity may vary. However, considering this model where maximum of the sample size is of Students and Professors and a handful of people into different service sectors, this particular model might hold true.

Coming on to people who experienced Work from Home

	Coefficients	Standard Error	t Stat	P-value
Intercept	2.398145134	0.994943947	2.410331899	0.036662565
[Social Media distractions]	–0.210386111	0.398365819	–0.528122899	0.608933157
[Poor Internet connectivity]	0.155768502	0.228288255	0.682332528	0.510524281
[Psychological Isolation and monotonous life]	0.043337955	0.29344596	0.147686324	0.885525661
[Salary cuts]	–0.049340577	0.306438568	–0.161012946	0.875289587
[Distractions at home/Improper working environment]	–0.172666228	0.319629567	–0.54020731	0.600877083
[Longer Working Hours]	0.543732504	0.190954951	2.847438636	0.017326006
[Procrastination of work because of improper supervision]	–0.067214196	0.311279878	–0.215928498	0.833384259
[Ineffective Communication with Team members]	0.065960989	0.297298282	0.221868045	0.828881951

Figure 2: Representation of factors affecting productivity for Work From Home

Competing Interest Statement

The author has read and approved the manuscript and takes full responsibility for its contents. No potential conflict of interest was reported by the author(s).

Acknowledgements

The author would like to thank the reviewers and editors of this manuscript.

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https://www.mckinsey.com/industries/public-sector/our-insights/saving-our-livelihoods-from-covid-19-toward-an-economic-recovery

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Horizon J. Hum. & Soc. Sci. 2 (S): 23 – 28 (2020)

Journal of Humanities and Social Sciences Research
www.horizon-JHSSR.com

CONCEPT

Work from Home during COVID-19: Impact on Labour Productivity and Economic Growth Rate of India

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ARTICLE INFO

Article history
RECEIVED: 26-Jun-20
REVISED: 25-Sep-20
ACCEPTED: 29-Sep-20
PUBLISHED: 15-Oct-20

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ABSTRACT

The unprecedented situation COVID-19 has completely removed the boundaries between work and personal life of employees around the globe. Now it is just the beginning of unlocking phase-1 and Indian industries are still in confusion, that, either to continue work from home temporarily or to regularize normal option. These industries also fear of remote working, which may reduce the productivity. Till date, no concrete road map is provided from Government of India. Migration is neither a new phenomena nor a big deal, but after COVID-19 lock down imposition, the way they are desperately wanted to return back to their homes, will be an unforgettable moment for every Indian. This raised a huge migrant labour crisis across industries in India. No vaccine has produced till date. So India government is facing difficulty to controlling the virus spread in densely populated places Considering the aforesaid conditions, a conclusion oriented applied research has been done to pick up different problem areas of 'working from home' and its impact on labour productivity. This gives us an insight, how quick will economic activities return to pre COVID-19 levels.

During COVID-19 economic activities has become standstill. So, for analysis purpose pre covid and post covid results of various sectors are compared to suggest the projection indicator to achieve our desired growth rate. This is basically a conclusive research. Industrial ratings given by different agencies are collected for accurate projection and suggestions. Financial data of various industries pre covid19 and post covid 19 across sectors are collected and interpreted.

Work from home will increase employee productivity, save time and energy of employee. But at the same time, measures should be taken to ensure work force productivity while 'work from home' by Indian industries. It also able to achieve optimum use of human resource and their by reduces the overall cost of operations which increase profit hence growth. Employee can go to any extent if their privacy is hampered while working from home like there may be chance that their ID pass word, credit card details taken by the coordinator through spy camera during monitoring remote work. So strategy and policy should be made accordingly to achieve the goal.

Work from home can be taken as a strategy for new employment and technological up gradation of industry to face future disaster.

Keywords: COVID-19, Work from Home, Productivity, Economy, Growth, Resources Model.

Introduction

The COVID-19 is an unprecedented event and it has totally changed our personal as well as professional life. Work place globally had closed down their office and allowed their employee to work from home remotely. In India professionals across different sectors have mixed opinion about remote working except they all agree on time and energy saving of employee to reach office or work place in Indian traffic. Engineers, IT employee, HR roles, Knowledge worker, consultants, stock market traders are seems to be happy with work from home. But finance, insurance and proprietary applications will find it difficult. Some organizations actually had to transport desktops to their employees' homes during lock down. These things are creating challenges for policy maker of 'work from' home in a weak Indian economy and strained financial system.

Statement of problem

Now it is just the beginning of unlocking phase-1 and Indian industries are still confused, will they continue work from home temporarily on current format or to stop here? They also fear remote working may reduce the productivity. Till date no concrete road map has been given from government of India. PM N. Modi in his speech on 2nd June 2020 at CII said "we will bring back our GDP growth rate "and insisted industry experts, researcher to find out/suggests some innovative road map to achieve this goal. On April 16th the international monetary fund has slashed its projection for India GDP growth in 2020 from 5.8% to 1.9%. After COVID-19 lock down imposition, that images of the Indian labour's, the way they were desperately seeks to back to their home will be an unforgettable moment for every Indian. This raised a huge migrant labor crisis across industries in India. No vaccine has produced till date. So India government is facing difficulty to controlling the virus spread in densely populated places.

Theoretical background

Industrial Engineering & Management has given the 5Ms of Money, Manpower, Methods, Materials, and Machinery as the key elements in Economy or a Sustainable Business. The present COVID has completely changed the industrial scenario. Previously Site Selection for any new setup for "remote working" or starting any new activity, these 5M were used, but later part about a decade Industry 3.0 tools are used for automation of industries. Due to the growth of telecom sector and digitalization of services, increase strength and demand of internet data connectivity, technological up gradation of Industries was felt and for that industries are willing to implement Industry 4.0 tools for flexibility their operations remotely as well as directly, before COVID-19, lock down. But in this phase of unlocking the issue of migrant labour has been raised. So to maintain the growth rate productivity of work force need to be enhanced. Again the productivity of India has two aspects, one is how to raise labour productivity to achieve desired growth rate and second is how to raise the labour productivity of lagging behind industrial sectors after COVID-19 impact.

Literature review

For this study to find the objectives literature review had been done as mentioned in below table.

Year	Author's name	Prospective on 'work from home' and productivity.
2004	Crosbie and Moore[1]	Authors are rightly said that for modern working life style, 'work from home' is not a total panacea but consideration should given to them, who are willing for it. They also highlighted the fact that those workers who were habituated in to stay away from home long time, may found work from home bit difficult.
2007	Gagendra and Harrison[2]	Authors found that it is difficult to monitor the employees performance while remote working from home.
2009	Stevenson and Walfers[3]	Authors found that for overall life satisfaction 'work from home' could be seen as favorable choice. This needs proper interaction between work and personal life.
2013	Amabile & Kramer[4]	Authors found that work from home is helping employee to make proper balance between office and home work. This study reveals the fact that 'work from home' saves time and energy of worker and enhance its productivity to achieve it's task targets.
2013	Beauregard.A. et.al[5]	Authors highlighted that mobile worker and part time partial home workers performances are higher to some extent, and they are satisfied with their job and payments. But sometimes when they seeks emotional supports from their co worker's, they are not able to get it from them.
2016	Go.R[6]	Author found that a big communication gap was created in between the superior and subordinate staff, while doing remote working.
2017	Richardson & Writer [7]	Authors found that by upgraded modern technology, it will be possible to enhance the work from home productivity with the increase usage of net, mail, fax etc.

Now the question comes, can it be possible to revive the Indian economy from this level after COVID-19? For this following objectives are made to develop suggestions.

Objectives

- To find whether 'work from home' will be the new strategy for industries to hedge the disaster risk in future.
- To ensure work force productivity while 'work from home' by Indian industries.
- To find COVID-19 impact on Indian Economy growth rate.
- To find labour productivity contribution in GDP growth rate.

Conceptual model

This above mathematical model was conceptualized for formation of hypothesis, testing of hypothesis, and external as well as internal validity. Since this was a conclusion oriented applied research external validity was given more priority, but independent and dependent controlled variables were defined to attribute the internal validity of study. Here work from home, capital equipment, applied technical efficiency were taken as independent variables, labour productivity was the mid variable, labour crisis, COVID-19 impact were control variables, GDP growth rate was taken as dependent variable for this study.

Hypothesis

Following hypotheses were made from our objectives for testing.

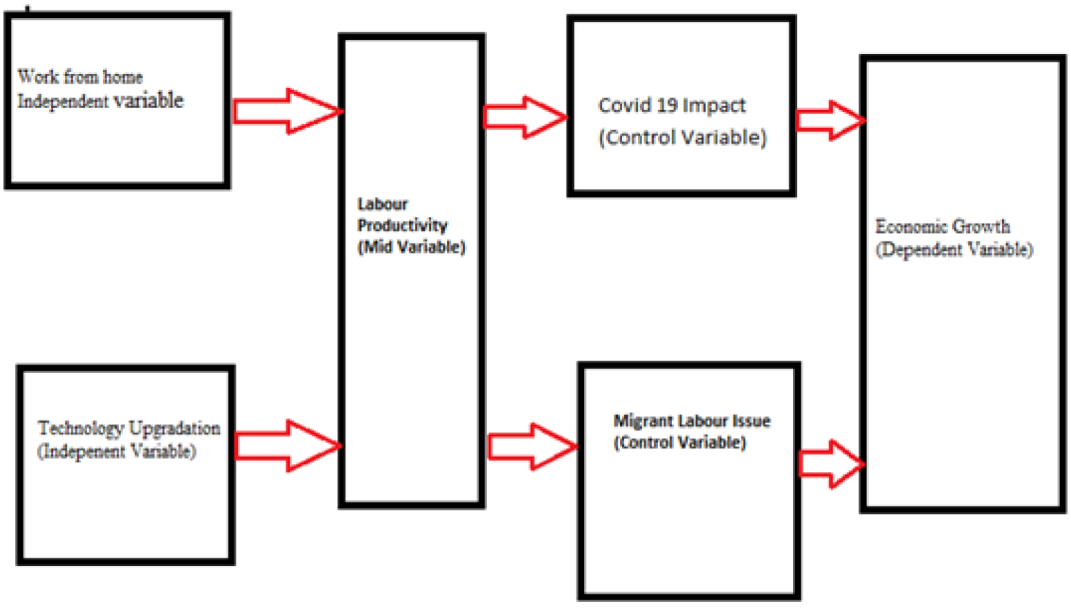
- Null hypothesis = Ho – There is no significant impact of COVID lock down and work from home on labour productivity.
- Alternate hypothesis = H'1 – There is a significant impact of COVID lock down and work from home on labour productivity.

Research methodology

For this study secondary data collection methods are used. Various industrial consultant opinions published, online survey report and media interview are incorporate to facilitate the analysis and conclusion. Industrial ratings given by different agencies are collected for accurate projection and suggestions. Financial data of various industries pre COVID-19 and post COVID-19 across sectors are collected and interpreted. GDP and economical data for 2014-2020 are collected from central government budget, RBI and CSO websites.

Size of research

An online survey was conducted after lock down period to collect the view point of CHROs, and HR heads of different organization in India. 100 organization across



Mathematical Model: Developed by Author

Table 1: Economical Data Financial Year 2014 to 2020

	2014	2015	2016	2017	2018	2019	2020
Gross value added GVA at year 2012	6.1	7.2	8.0	7.9	6.9	6.6	5.3
Agri sector	5.6	–0.2	0.6	6.3	5.0	2.9	2.0
Industrial sector	3.8	7.0	9.6	7.7	5.9	6.9	3.1
Service sector	7.7	9.8	9.4	8.4	8.1	7.5	7.5
GDP (Real)	6.4	7.4	8.0	8.2	7.2	6.8	5.6
Private final consumption expenditure (PFCE)	7.3	6.4	7.9	8.2	7.4	8.1	4.9
Government final consumption expenditure (GFCE)	0.6	7.6	7.5	5.8	15.0	9.2	10.3
Gross fixed capital formation (GFCF)	1.6	2.6	6.5	8.3	9.3	10.0	6.0
GDP Nominal	13.0	11.0	10.5	11.5	11.4	11.2	9.2
Wholesale inflation average	5.2	1.3	–3.7	1.7	2.9	4.3	1.5
Retail inflation average	9.4	5.9	4.9	4.5	3.6	3.4	3.9
Current account deficit (% of GDP)	1.7	1.3	1.1	0.6	1.8	2.1	1.8

Source: Central budget, RBI and CSO

Table 2: Labour productivity growth of India (1992-2020)

Last year	Previous year	Min	Max	Unit	Frequency	Range
2019	2018	3.64	5.28	Percentage	Yearly	1992–2020
2002	2010	1.32	8.00			

Data source from CEIC DATA updated on 01 July 2020

sectors were selected for our study. Among them 72% respondent agree on the point that, COVID-19 lock down and migrant labour issue force them to operate remotely from home, which leads to fall in productivity sharply. While 28% organizations were disagree on this point.

Data Interpretation

Hypothesis testing

Survey results are used to test the null hypothesis.

Since sample size taken for survey was 100, Z test was chosen for hypothesis testing.

72% respondents agree on the point that COVID-19 and work from home have reduced the productivity and 28% were disagreeing. So our hypothesis becomes

Ho:μ = .72

H1:μ# .72

Here n = 100, p = .72, q = .28

- Mean = .72 × 100 = 72
- Standard deviation = $\sqrt{npq} = \sqrt{100 \times .72 \times .28} = 4.489$

Since n > 30, Z test was chosen with 95% of confidence for α = 0.05 two tailed test.

Since this an industrial survey 50% is usually taken as favorable outcomes, $\hat{p}$ is taken as .5 for this study. From all these values, 'Z' equation becomes

$$Z = \frac{(\hat{p} - p)/\sqrt{pq}}{n} = -5$$

$$Z = -5$$

Since z value for 95% confidence and α=0.05 is equal to 1.960

Decisions

Z = –5 < –1.960, hence null hypothesis is rejected and alternate hypothesis is accepted. From this it is apparent that 'work from home during COVID lock down has a seriously impacted the labour productivity across sectors in India.

The projection indicator for desired growth rate

From the table-1 and table 2 data it was found that Indian labour productivity data available from December 1992 to December 2019, with productivity averaging at 5.3%.

But productivity and GDP growth rate after COVID-19 lock down, dropped drastically due to job losses. The International Monetary Fund has slashed its projection for India GDP growth in 2020 from 5.8% to 1.9%. India's population as on march 2020 reached nearly 1,431.00 million with an unemployment rate of 5.36 and labour participation rate of 49.29 as in December 2019 [8].

As, **Productivity = Output/unit Input = GDP output / worker's input**

As desired by PM of India Mr. N. Modi, in order to achieve 8% GDP, labour productivity should rise to 6.3%. The productivity of India has two aspects, one is how to raise labour productivity to achieve desired growth rate and second is how to raise the labour productivity of lagging behind industrial sectors after COVID-19 impact.

Finding and Suggestions

As per CSO, data lagging behind productivity sectors are mentioned as below

Sectors	Productivity rate
Construction	0.4%
Agriculture	3.2%
Mining	4.8%

Leading sectors are as mentioned below

Sectors	Productivity rate
Manufacturing	7.2%
Electric gas and water supply	7.7%
Transport, storage, and communication	7.4%
Community, social, personal services	6.2%

In order to achieve a high GDP growth rate government should formulate some strategy to increase the lagging sector productivity level during short run after COVID-19 unlocking to make a balance in overall productivity. To meet the impact of this unprecedented event all leading sectors should take strategically steps to contribute in GDP growth rate of India. Work from home will increase employee productivity, save time and energy of employee. But at the same time measures should be taken to ensure work force productivity while 'work from home' by Indian industries. It also able to achieve optimum use of human resource and their by reduces the overall cost of operations which increase profit hence growth. Employee can go to any extent if their privacy is hampered while working from home like there may be chance that their ID pass word, credit card details taken by the coordinator through spy camera during monitoring remote work. So strategy and policy should be made accordingly to achieve the goal.

Value

According to Hudson Maxim "All progress is born of inquiry". This study has been done during first unlocking phase of COVID-19 to find whether 'work from home' will be the new strategy for industries to hedge the disaster risk in future Since many researcher are predicting the effect of COVID-19 will remain up to 2022, this study can be helpful for future researcher to unfold the risk.

Conclusion

Engineers, IT employees, HR roles, Knowledge workers, consultants, stock market traders can work from home. But finance, insurance and proprietary applications will find it difficult. Some organizations actually had to transport desktops to their employees' homes during lock down. These things are creating challenges for policy maker of 'work from home' in a weak Indian economy and strained financial system. So in present scenario social distancing with limited resources and working guide line advisable by NCDC will be definitely helpful in this unlocking situation to give momentum to economy towards growth. Work from home can be taken as a strategy for new employment and technological up gradation of industry to face future disaster.

Competing Interest Statement

All authors have read and approved the manuscript and take full responsibility for its contents. No potential conflict of interest was reported by the author(s).

Acknowledgements

The author(s) would like to thank the reviewers and editors of this manuscript.

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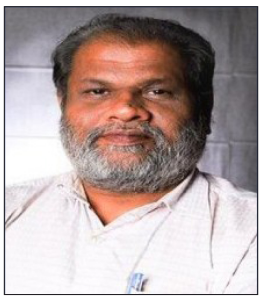

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Horizon J. Hum. & Soc. Sci. 2 (S): 29 – 36 (2020)

Journal of Humanities and Social Sciences Research
www.horizon-JHSSR.com

CONCEPT

Exploring Factors Influencing the Users' Intention to Use *Aarogya Setu* Contact Tracing Mobile Health Application during COVID-19 Pandemic

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ARTICLE INFO

Article history

Received: 26-Jun-20
Revised: 25-Sep-20
Accepted: 29-Sep-20
Published: 15-Oct-20

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ABSTRACT

The purpose of the study is to explore the cognitive and social factors influencing the usage intention of *Aarogya Setu* m-health app. This paper draws on extended technology acceptance model (TAM 2) to develop a conceptual framework to explain the factors influencing the usage intention of the *Aarogya Setu* m-health app.

The study suggests a framework which explains the factors such as "Perceived ease of use", "Perceived usefulness" and "Perceived privacy risk" determines the usage intention of the *Aarogya Setu* m-health app, where as "Subjective norm" has no impact on usage intention. Four research propositions are postulated to promote the future research.

Keywords: *Aarogya Setu*, TAM, Intention to use, Contact tracing, m-health app.

Introduction

Contact tracing, followed by isolation and early treatment are crucial control measures to combat infectious diseases (Eames and Keeling 2003). The current pandemic caused by novel coronavirus, is a highly infectious respiratory disease and according to WHO, the virus spreads over 215 countries around the globe and is responsible for high casualty. As there are no specific therapeutic drugs and vaccines available to neutralize or control the virus, social distancing and contact tracing are two effective measures to check the spreading of the virus to certain extent. Contact tracing mobile health applications (m-health app) are climacteric measures for the COVID-19 surveillance, risk assessment, contact tracing of infectious persons and situation evaluation (Kodali et al. 2020). As manual contact tracing procedure is inefficient and time taking process, leads to poor control over infection status monitoring, most of the countries have adopted ICT enabled tracking facilities as a public health care strategy for fast tracking and easy to manage the infection spreading and mobile based application (app) helps users to aware about their own health status with respect to infectious person and suspected persons around them (Vaithianathan et al. 2020).

Indian's m-health app, *Aarogya Setu* which is designed for contact tracing of infectious person and provides health tips to get rid from novel coronavirus has significantly contributed in terms of contact tracing and disease management during COVID-19 pandemic (Kodali et al. 2020). After launching by Government of India (GoI) on 2nd April 2020, the app is the most downloaded and reviewed among all heath and contact tracing applications available in google play store (Davalbhakta 2020). *Aarogya Setu* contact tracing m- health app is based on Bluetooth enabled contact tracing technology, which collect information from nearby devices and update the infection status as well as number of users under different predefined ranges and their self-assessment status.

To use m-health application depends upon the different cognitive and social factors of the users (Cho et al. 2014). *Aarogya Setu* m-health app is a new and important mobile app, used during this pandemic for personal and public health safety. It is important for the policy makers

and researchers to understand the factors, which are influencing the intention to use of *Aarogya Setu* m-health app, which can help them to make action plan for the large scale adoption of this m-health app to check the spreading of novel coronavirus. In this study, we developed a conceptual framework to explain the factors that influence the intention to use *Aarogya Setu* m-health app. The factors are extracted from previous study and organized in the conceptual framework by relying on TAM 2 model (Venkatesh and Davis 2000).

Contact tracing and mobile health application

Contact tracing is an important and essential tool for the Government to check the spreading of novel coronavirus (Cho et al. 2020). It is a mechanism of detecting potentially infected people by analyzing the patient's social contacts. This can be done through a mobile app with Bluetooth as the technology and that Bluetooth used to determined direct face to face interaction by collecting the Bluetooth IDs of each person come closer and the Governments in some countries are using GPS based contact tracing mobile app to track the infected people (Brack et al. 2020). The contact tracing m-health apps are now gaining importance by different countries for example, the Singapore Government has developed a contact tracing m-health app called, "Trace Together" (Abeler et al. 2020), China and Israel have also developed their GPS enabled contact tracing mobile app to get the contact details and infection status of the infected persons (Jhunjhunwala 2020).

The Indian version of contact tracing m-health app, "*Aarogya Setu*" is designed for android operating system, iOS operating system and featured phones and can be operated by the users with any network types like 2G, 3G and 4G and the app is available in 11 different Indian languages. A person can download the app and first carry out self-assessment, which helps users to know about the risk of being infected by answering a few questions related to their health condition, symptoms and travel history over the last fifteen days (Jhunjhunwala 2020). *Aarogya Setu* m-health app uses low-intrusive Bluetooth signals between individuals and the infected person to determine the proximity. All the information captured during self-assessment is uploaded in the secure server of "National Informatics Center" (NIC) along with the user's geo-location via GPS with a proper user consent. Later the application only uses GPS to detect the coronavirus infection density in a particular geographical region and never trace user's movement via GPS according to privacy policy of the app (Jhunjhunwala 2020).

Theoretical background

In this study, we adopted extended TAM, also known as TAM 2 established by Venkatesh and Davis (2000), to explain the intention to use Arogya Setu m-health app. Because TAM 2 is believed to be the most robust and appropriate to explain the behavioral intention and actual behavior to access Information system and in this theoretical model all the independent constructs are strongly explained the variance in usage intention (Venkatesh and Davis 2000). TAM 2 is the theoretical extension of Technology Acceptance Model (TAM; Davis 1985) which inspects the behavioral intention and actual behavior of an individual towards a technology by excluding the mediating factor "Attitude" of original TAM. Figure 1 illustrating the three antecedents to "behavioral intention for a technology' ultimately which leads to actual usage behavior of the technology. We excluded other factors of TAM 2 which do not directly influence the intention to use a technology.

Conceptual framework and propositions

We draw on TAM 2 to organize our framework and in the present model, intention to use is examined rather than actual behavior towards *Aarogya Setu* m-health app because this m-health app is new for the users and still at initial stage. We incorporated an additional factor in our conceptual framework namely "Perceived Privacy Risk" (PPR), which is an important factor influence the intention to use *Aarogya Setu* m-health application because mobile apps which access the personal information of the users, their usage always influenced by PPR (Merhi et al. 2019). Figure 2 provides a graphical representation of our

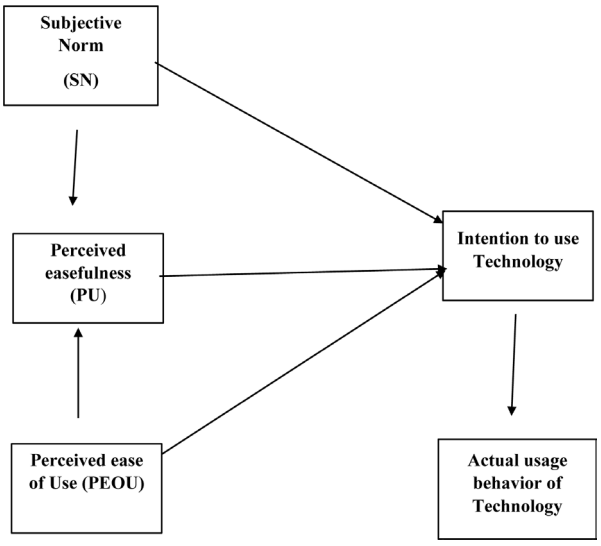

Figure 1: Extended Technology Acceptance Model (TAM 2; Venkatesh and Davis, 2000)

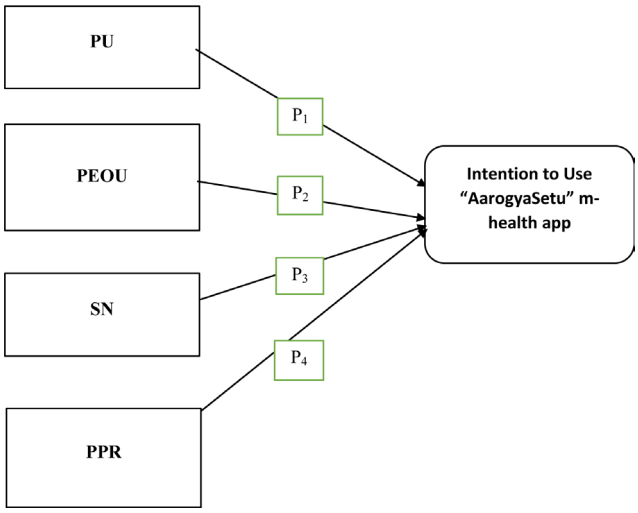

Figure 2: Antecedents of intention to use *Aarogya Setu* m-health app.

conceptual framework, in which "Perceived usefulness" (PU), "Perceived ease of use" (PEOU), "Perceived Privacy Risk" (PPR) and "Subjective Norm" (SN) are antecedents of intention to use the Arogya Setu m-health app.

Antecedents of intention to use *Aarogya Setu* m-health app

According to TAM 2, PU and PEOU are two important independent constructs which directly influence the intention to use a particular technology. In this study, we adopted PU and PEOU of *Aarogya Setu* m-health app as antecedents of intention to use *Aarogya Setu* m-health app. Another important factor which is incorporated in TAM 2 is SN, derived from Theory of Reasoned Action (TRA; Fishbein and Ajzen 1975). We considered SN as an antecedent of intention to use the *Aarogya Setu* m-health app. PPR is considered as an important factor and antecedent for using mobile app (Wang et.al 2016; Merhi et al. 2019) hence in our study, we incorporated the PPR in the conceptual framework as an antecedent of intention to use *Aarogya Setu* m-health app.

Perceived Usefulness (PU)

PU refers to, "the degree which a person believes that using a particular system or technology enhances his or her ability to perform a job or task" (Davis 1989). PU has a positive and direct impact on usage intention of information technology (Taylor and Todd 1995; Venkatesh and Davis 2000). A study by Lu et al. (2003) conceptualized that PU positively and significantly influences the usage intention of wireless internet through portable devices (e.g. mobile, tabs and laptops). Some empirical evidence from various studies confirmed the effect of PU on usage intention of m-health app. PU has a strong and significant impact on usage intention of m-health apps (Mohamed et al. 2011). A study on Singaporean women by Lim et al. (2011) found that the intention to use mobile phones to seek health information was positively and significantly predicted by PU. The usage intention of health care mobile devices like mobile phones, tablets etc. among the health care professionals significantly and positively influenced by the PU of the devices (Rasmi et al. 2018). The PU has a strong impact on intention to use m-health apps by senior citizens in Iraq (Saree et al. 2019). The investigation of PU and its impact on usage intention, both for m-health care devices and in m-health app usage behavior context confirmed that PU is a good predictor of usage intention of m-health app. Therefore, we proposed the following proposition:

P1. **Perceived usefulness of *Aarogya Setu* m-health app will have a significant impact on intention to use *Aarogya Setu* m-health app.**

Table 1: Operational definition of factors identified as antecedents of intention to use *Aarogya Setu* mobile application.

Constructs /Factors	Operational Definition	Source
PEOU	PEOU refers to, "the degree to which a person believes in the use of technology or information system requires less effort".	Venkatesh and Davis (2000); Davis et al. (1989)
PU	PU can be defined as, "the degree to which a person thinks a given technology or information system could improve his/her performance".	Venkatesh and Davis (2000); Davis et al. (1989)
PPR	Privacy risk can be defined as, "Profess of individuals, to determine for themselves when, how and to what extent information about us is communicated to others".	Merhi et al. (2019); Miyazaki and Fernandez (2001); Westin (2003)
SN	SN refers to "the social pressure by peers (e.g. friends, family members) which motivate an individual to perform a behaviour.	Ajzen (1991); Fishbein and Ajzen (1975); Venkatesh and Davis (2000)
Intention to use or Usage intention	It can be defined as the conscious plans of an individual or the likelihood that the individual will perform a certain behaviour or not	Ajzen (1991); Fishbein and Ajzen (1975); Venkatesh and Davis (2000)

Perceived ease of Use (PEOU)

PEOU refers to, "the degree an individual believes that using a technology would be free of effort and effort can be the resource which a person allocates to different tasks for which he or she is liable (Davis 1989). The research on theoretical extension of TAM, which was a longitudinal study by Venkatesh and Davis (2000), confirmed that PEOU has a direct and positive impact on usage intention. A focus group study, carried out by Schnall et al. (2015) among the persons living with HIV and HIV health care providers those are using m-health app for monitoring and management of HIV, found that PEOU is a major predictor of intention to use m-health app to monitor and manage the HIV. A study based on TAM 2 confirmed that PEOU has a significant impact on usage intention of m-health care systems among the medical professionals (Wu et al. 2007). Intention to use health care informatics via m-health app, designed for health care advice for women well-being, among the ageing women determined by the PEOU of the health care informatics (Xue et al. 2012). Findings of a meta-analysis conducted by Zhao et al. (2018), included 35 previous studies on mobile health service adoption to analyze the 8 factor's influences towards attitude and behavior, reviled that PEOU as a major determinant for usage intention of m-health care services. The investigation refers, the PEOU is an important antecedent for usage intention of m-health app, therefore we postulate the following proposition:

***P2*. Perceived ease of using *Aarogya Setu* m-health app will have a significant impact on intention to use *Aarogya Setu* m-health app.**

Subjective Norm (SN)

SN, considered as a major predictor of behavioral intention in the Theory of Reasoned Action (TRA; Fishbein and Ajzen 1975), and later it was included in the Theory of planned behavior (TPB; Ajzen 1991). SN refers, "the function of normative belief about the social expectation of significant of others (e.g., friends, spouses, parents etc.), in other way it can be defined as the social pressure, an individual faces while deciding whether to behave in certain way" (Park 2000; Venkatesh and Davis 2000). The reason behind the direct effect of SN on behavioral intention is individuals may select to perform a behavior, even they are not motivated to perform a behavior, if they believe their peers think they should, and then they may be motivated to perform the behavior by complying with them (Venkatesh and Davis 2000). Davis et al. (1989), in their study found that SN was not a determinant for behavioral intention to accept computer technology and mention for further research to investigate the impact of SN on usage behavior. In TAM 2 it is empirically concluded that SN has a positive and significant impact on usage behavior (Venkatesh and Davis 2000). Many prior empirical researches have been done in the context of the m-health app to understand the impact of SN on intention to use m-health app. A study in India by Pai and Alathur (2019), found no significant impact of SN on intention to use m-health apps. Subjective norm has a very less significant impact on usage intention of m-health app among the older adults (Saare et al. 2019). The findings of a comparative study between middle aged and old users by Deng et al. (2014), confirmed that SN has no significant impact on usage intention of m-health app for two groups. SN has an indirect effect on acceptance of IT health services and is mediated by PEOU (Yu et al. 2009). The above investigation on prior research on adoption of m-health apps confirmed that SN has no significant impact on usage intention of m-health apps and in some cases, SN has indirect effect on usage intention of m-health apps. By noting this findings, we proposed the following proposition:

***P3*. Subjective norm will have no direct and significant impact on intention to use the *Aarogya Setu* m-health app.**

Perceived Privacy Risk (PPR)

Privacy and security in e-services or internet enabled services context is of considerable importance to users and regulators (Featherman et al. 2010). Users always evaluate various types of risk, while deciding to use e-services (Featherman and Pavlou 2003). Data privacy is one of the important perceived risks while users choose to adopt e-services (Miyazaki and Fernandez 2001). According to Westin (2003), information privacy can be defined as, "Claim of individuals, to determine for themselves when, how and to what extent information about us is communicated to others". Individuals always reckon risk and benefit while deciding whether to disclose the confidential information, if risk outweighs the benefits then they don't want to disclose such information (Culnan and Armstrong 1999). In prior studies, it was empirically concluded that, PPR has a negative impact on usage intention of e-services (Sheehan and Hoy 1999; De Ruyter et al. 2001; Featherman et al. 2010). In e-health services context, m-health monitoring and management app largely determined by the privacy concern of personal health information (Premarathne et al. 2015). Various m-health

apps collect and offer critical sensitive health information, if the privacy is not maintained properly then it leads to poor adoption of m- health apps (Delhing et al. 2015). Privacy and Security features assist users to select m-health app (Adhikari et al. 2014). Privacy concern has a negative and significant impact on intention to adopt m-health care services (Guo et al. 2012). Data privacy is an important factor to adopt the contact tracing cum m-health app during pandemic and people are more concern about their private data while choosing contact tracing m-health app (Rowe 2020; Altuwaiyan 2018; Bengio et al. 2020). By investigating the prior research, we postulate the proposition:

***P4*. Perceived privacy risk for *Aarogya Setu* m-health app will have a negative and significant impact on intention to use the *Aarogya Setu* m-health app.**

Discussion

The current pandemic due to the novel Coronavirus is putting pressure on public health administrators and policy makers to keep the public protected from the virus and control the spreading of disease through different strategies like contact tracing, social distancing and create awareness for prevention measures among the people. The contact tracing m-health apps are useful to trace the contact details of the infected person and provide different health and prevention measure tips which help people to combat the virus. Users' intention to use these mobile apps need to be understood, so that a better strategy can be formulated to increase the adoption of the contact tracing m-health app. In our study, we try to understand the factors which are influencing the usage intention of *Aarogya Setu* m-health app by conceptually reviewing the prior studies and developed a framework, which illustrate the four antecedents of intention to use *Aarogya Setu* m-health app. We rely on TAM 2 to develop our own version of TAM for *Aarogya Setu* m-health application.

The two main predictors namely PU and PEOU of TAM 2 incorporated in our framework to understand the usage intention of *Aarogya Setu* m-health app. By investigating prior studies in the context of m-health app, we concluded that usage intention of *Aarogya Setu* m-health app can be determined by PU of *Aarogya Setu* m-health app and PEOU of this mobile app. Many empirical studies found that usage intention of m-health apps significantly predicted by these two factors (Wu et al. 2006; Mohamed et al. 2011; Xue et al. 2012). We conceptualized PU of the *Aarogya Setu* m-health app by relying on the original definition of Davis (1989) as, "the degree an individual thinks by using *Aarogya Setu* m-health app help him/her to know about the infection status of a particular area and help him/her for self-assessment during pandemic". The PEOU of *Aarogya Setu* m-health application can be defined by relying on the definition of Davis (1989) as, "the degree an individual thinks that less effort is required to use the *Aarogya Setu* m-health app".

PPR is another predictor of *Aarogya Setu* m-health app. In our investigation on impact of PPR on usage intention of m-health app, many empirical evidences from prior studies (Culnan and Armstrong 1999; Delhing et al. 2015; Rowe 2020) confirmed that PPR has a negative and significant impact on intention to use m-health app. By relying on the definition of information privacy by Westin (2003), we conceptualized the definition of PPR for *Aarogya Setu* m-health app as, "Claim of *Aarogya Setu* m-health users, how, when and what extend their personal health information shared with other users". Another construct, SN which positively and significantly influence the intention to use in TAM 2 (Venkatesh and Davis 2000) has no impact on usage intention of m-health app (Deng et al. 2014;Pai and Alathur 2019) hence, we concluded that social pressure is not a predictor for intention to use *Aarogya Setu* mobile application.

Theoretical and managerial implications

Discussing about theoretical implications, this study developed a TAM framework for *Aarogya Setu* m-health app, which helps to understand the intention to use *Aarogya Setu* app during pandemic. We proposed four propositions, which confirmed how the four factors influence the intention to use *Aarogya Setu* m-health app and conceptually defined each factor for *Aarogya Setu* m-health app context. This study will provide a theoretical understanding for Contact tracing and m-health apps for future studies.

The conceptual framework and the conceptually defined each factor for the *Aarogya Setu* m-health app help the health policy makers and administrators to get a better insight for an individual's intention to use the *Aarogya Setu* m-health app. The policy makers should focus to create awareness for the usefulness of the Arogya Setu m-health app. Features and accessibility of the *Aarogya Setu* m-health app can be improved for hassle free and less effort to use the mobile application. The personal health information, those are stored in the NIC database and shared with users need to be protected and privacy of health information should be maintained safely and

securely without any data breach to increase the usage of *Aarogya Setu* m-health app.

Conclusion

This study refers to the TAM framework for intention to use *Aarogya Setu* m-health app by relying on TAM 2 for theoretical underpinning. We concluded that the factors such as PU, PEOU and PPR are the determinants of usage intention of *Aarogya Setu* m-health app, where as the SN has no direct impact on intention to use *Aarogya Setu* m-health app, which contradicts the theory. PEOU and PU positively influence the intention to use *Aarogya Setu* m-health app and PPR has a negative impact on intention use, which refers, if the PPR weighted than the benefit of *Aarogya Setu* m-health app then it will decrease the use of the app. At the end we conceptually defined the factors in our study context which influence the intention to use the *Aarogya Setu* m-health app. This study may help researchers to carry forward further research on intention to use contact tracing m-health app. Our developed framework and conceptually defined factors in the context of *Aarogya Setu* m-health app, can help the policy makers and health administrators to understand behavioral intention for *Aarogya Setu* m-health app in a better way and can help policy makers and administrators to improve the accessibility of the app.

Limitations and future research

Some limitations are noted in our study, this study solely depends on the previous study, without including any empirical data. We only established the relationship between the independent constructs (e.g.PU, PEOU, SN, PPR) and dependent construct(Usage intention), rather examining the relationship between the independent constructs, which are related according to TAM 2. We only included four factors to examine the relationship with intention to use, whereas other factors may influence the intention to use mobile health applications.

The future research may empirically test the proposition, by gathering data from the users for better validation of the study. Multivariate techniques like structural equation modeling can be used for construct validation and reliability and can predict the structural pattern between the latent constructs of this study. The framework may be useful to understand the intention to use contact tracing and m-health apps in different settings. Impact of SN on usage intention of m-health app needs to be studied further for a better understanding.

Competing Interest Statement

All authors have read and approved the manuscript and take full responsibility for its contents. No potential conflict of interest was reported by the author(s).

Acknowledgements

The authors would like to thank the reviewers and editors of this manuscript.

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Horizon J. Hum. & Soc. Sci. 2 (S): 37 – 44 (2020)

Journal of Humanities and Social Sciences Research
www.horizon-JHSSR.com

ORIGINAL ARTICLE

Digital Escapism

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ARTICLE INFO

Article history

RECEIVED: 26-Jun-20
REVISED: 25-Sep-20
ACCEPTED: 29-Sep-20
PUBLISHED: 15-Oct-20

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ABSTRACT

With increased time-spent on internet based gaming and recreational applications, there is now a new trend of digital escapism, along with private space in the virtual world. When we talk about escapism, sometimes it carries feelings of guilt in mind. Excessive use of the internet, mostly for pleasure, leads to 'internet-addiction'. It in turn leads to psychological disorders. It creates "Internet Disorder syndrome" or "Digital Escapism" which invites stress, depression, deviation from own goal, sleeplessness and anxiety.

This conceptual paper examines the gravity of such addiction and the nature and types of digital escapism. This paper observes that, the users, when addicted, would always love to live online and leave reality.

Keywords: Digital escapism, digital consumption, internet addiction, Internet avatars.

Introduction

With the innovation of information communication and technology (ICT), the majority of people are spending more time over the internet. Because this internet makes people's lives easier it has become an integrated part of our daily life (Ponsignon, & Derbaix, 2020). It is an essential tool for eliminating the human geographical boundaries by becoming a best way to transform from the "physical world" to the "virtual world" (Kumar, Mondal, 2018). People are engaged in so many activities like entertainment, video games, gambling, and many other activities for getting pleasure from unpleasant circumstances but on the other hand they become addicted with the use of these activities regularly for a longer period of time. As a result, they become addicted with such activities (Triantafillidou, & Siomkos, 2018). When human beings do the same routine task for a long period of time, they want some change, which most of the time may not be possible in real life due to various constraints of life. There comes a term "Escapism" – A psychological behaviour observed in humans for a long time. Escapism is switching away from the real situation when someone can't change the state he/she lives in. "All types of voids and lack of self-esteem lead to Escapism". This behaviour leads to a kind of addiction in life, which can be termed as ill-mannered or foul behaviour. So in any situation between life and death "Escapists" are not well treated. Suicidal tendency is the best example of Escapism behaviour.

Second life

Second life is nothing but a virtual world or we can say a Digital world, where people are known as "**Residents**". In this platform people create virtual representations of themselves. It happens when people are addicted to this digital world for their enjoyment or for internal satisfaction. This habit leads to escapism. More than 1million users are registering their name in this virtual world all around the globe (Lindon, 2013). It happens due to avoidance of any situation in life. In early days' life was slow, giving ample scope to persons to find restfulness and peace from what they used to do for their livelihood. But day by day stressful fast life made humans just like a

robot, a machine. While looking at this aspect the mind should be focused to analyse cases instead of the physical body. When we talk about escapism, sometimes it carries feelings of guilt in mind. To avoid such guilt, the changed escaped state is maintained with secrecy or adopted without notice of others and this is also referred to as "Second Life".

Escape scale

Two different motivational scales can measure escapism (Stenseng, Rise, & Kraft, 2012). According to them, different type of engagement denotes in dualistic model of escapism, where the psychological states can be obtained by the different activities such as drug abuse, sexual interest fulfilment, suicide ideation, internal satisfaction etc. In this manner, especially Stenseng derives the condition of escapism that can have both positive and negative implications and results. The author also argues that there are two important forms of escapism with different effective outcomes that depend on motivational focus which lies behind the immense activities. That can be either Self-Suppression or Self-Expansion (Stenseng, Rise, & Kraft, 2012). Self-Suppression form of escapism encourages the users to run away from the negative and unpleasant thoughts, self-perceptions and emotions whereas self-expansion increases to adopt the positive experience by engaging in different activities and developing a new life. Escape scale measures the self-suppression and the self-expansion on the basis of user's favourite activities such as gaming, sports, entertainment. In some cases these two dimensions differ from each other.

Escapism as therapy to divert negativity

Life is getting more challenging day-by-day. Innovation has empowered every minute and every day ways of life where we are consistently available to come in to work. Stress is on the ascent as is depression and nervousness. Accordingly, there is a more noteworthy need than any time in recent memory for individuals to discover approaches to escape all together and keep up mental and passionate strength. Society never understands individuals quitting and disregarding professional bureaucracies and workplace issues. Finding adequate types of escapism has gotten more fundamental than any time. People can shift themselves away from the burdens and strains of the monotonous routine by numerous manners. Because of these reasons people are getting more closure to Internet use, where Internet assistance is like internet based therapy (Wade, 2010). In this regard, mental interruptions make pain simpler to take, and those pain cannot affect simply in an individual's mind. The result shows that it is not only a psychological problem but also a neurological mechanism, which can relieve an individual's state of mind. Instead of suffering in negativity or from stress, in some cases it's a simple way to move mindfulness towards something which is completely different to allow individuals to "cool down" and temporarily forget their trouble, stress and anxiety (Handle, 2013). Different escapist activities like connected with social media, T.V watching videos, playing games are help to overcome from the above mental illness or from psychological illness (Evans, 2001). These escapist activities give relaxation or break the monotonous routine in daily life, stress relieving, pleasure seeking, people are enjoying their fantasy world because escapism can be quite productive, as imagination which leads to innovation and improvement. In this way, Escapism became a therapy for avoiding the negativity (Warmelink, Harteveld, & Mayer, 2009).

Types of Escapist Activities

Escapist activities are nothing but short activities which give relaxation for a longer period of time. This escapist activity divided into four major types, according to Evans.

1. **Evasive** Evasive activities are literally escapism, in which users are engaged deeply and avoid other activities. We can take example, nowadays students and children are more involved in their virtual world and forget the physical world where they present.

2. **Passive** passive escapist activities are those, which consider for a short period of time, which allow users to free from their current situation and do not require much from users' cognitive effort or interactivity beyond their attention and appreciation.

3. **Active pursuits** When an escapist gives his/her actual input for escapism, such activities like watching videos, playing games, video games, are helpful for escaping themselves.

4. **Extreme** Extreme activities may indicate a negative impact on the users. Which may be possible by being addicted to their active escapist activities. For example: excessive gambling, involving in video game, and excessive watching of pornography video may harm the users as well as their family members, society etc (Evans, 2001).

Major causes of Digital Escapism

There are so many major causes which may indicate or force them to divert their mind from their physical world to virtual world. Such major causes are following which help the users to involve in the virtual world:

- **Addiction to drugs**

According to the **National Institute on Drug Abuse**, Addiction is a chronic mental disorder, which is described by drug seeking and utilize that in habitual, or hard to control, regardless of destructive outcomes. The initial choice to consume drugs and alcohol is wilful for the vast majority, however regular use can prompt mind changes that challenge the individual's self-control and interference with their ability to resist their intense urges to take drugs. When a person takes drugs, most of the drugs are directly affected by the brain's "Reward Circuit", which may lead to *Euphonia* as well as *chemical messenger dopamine*. These systems encourage the person to repeat behaviour needed to thrive such as eating and spending more time with their loved one. As a person, continuous drug consumption may decrease the adaptation ability which the reward circuit responds to. Then mind adaptation lead to the individual turning out to be less and less to get delight from different things they once enjoyed, similar to food, sex, or social exercises. In this situation the internet helps them to fulfil their desire, what they actually want. By using Internet pornography they might be satisfy internally but by watching the internet pornography videos regularly or addicted with these, affect the social life, family, peer group etc (Park et al., 2016).

- **Cybersex Addiction**

It means self-explanatory internet addiction. It includes the pornography videos, adult websites, sexual fantasy, adult chatroom, web cam services etc. are the major cause of escapism. Users are mostly obsessed with these activities and transform from their real world to virtual world, as a result it hampers one's real life (Hoeg, 2020).

- **Addiction to social media**

Social media addiction is nothing but a behavioural addiction, which is characterised by over concern with the social media, driven by uncontrollable urge to log in or use social media (Aljuboori, Fashakh, & Bayat, 2020). Social media addiction became a psychological disorder like other disorders. This Social Media Addiction Scale affects six core elements of addiction, such as, Mood Swings (excess level of involvement changes the state of emotions), resilience (behavioural, cognitive, and emotional support from Social Media), Tolerance (by increasing the use of social media), Conflict (interpersonal problem also occur due to excess use of social media), Withdrawal symptoms (when social media restricted, feeling unpleasant physical and emotional symptoms), relapse (addicted people quickly return to their social media after a restrict period (Andreassen, Torsheim, Brunborg, & Pallesen, 2012). Long term psychological impact of social media affects the individual and their individual sense of **"Self"** remains to be seen. Nowadays, social media like Facebook, LinkedIn and Twitter are the best tools that have the capacity to build a *virtual community***,** where users are played as an **"Avatar",** by posting their pictures**.** But day by day this virtual world forced individuals to ignore their real world or physical world where they live. In this regard, virtual life has had extreme impact in our daily lives, which not our real world. For example: when people are so much happy and excited, they prefer to post their happy moments in social media like Facebook, Twitter, Instagram but when the people are not happy then they consciously or unconsciously compare themselves with others and try to, which is not a real world. As a result, they create a virtual world where they try to find out their happiness by escaping from their own real world (Thomas, 2016).

- **Addiction to Gaming**

Now-a-days Computer or smartphone gaming has become an addiction which is available both online as well as offline. Everyone, especially youth, are so much obsessed with their respective gaming platforms. It is a way of escaping from the problems and relieving from a dysphoric mood like (feeling of helplessness, anxiety, stress and depression). These dysphoric moods are positively associated with the game addiction (Wang, Sheng, & Wang, 2019). But game addiction endured less psychological wellness rather than increased mental illness, anxiety and depression which leads to social isolation (Stockdale, & Coyne, 2018). Dangerous versatile video gaming has been characterized as a phenomena wherein users strongly depend on portable games and can't resist playing them more than once over a continuous period of time, (Sun, Zhao, Jia, & Zheng, 2015). Users tried to cope up with their emotional distress by playing games, but excessively addicted with online games for a longer period of time which separate them from their real- relationship or from real world. As a result, it is caused by severe psychological problems called Depression (King, & Delfabbro, 2016).

Online Gambling Advdiction

Teens and young adults are addicted to online gambling. They are more active in casinos and other physical locations which are available 24/7 anywhere through the internet. Online gambling is easy for people to access their bank accounts and credit cards easily which help them to invest money in betting. There are registered websites which are legal and less risk is associated with those, but many are not legitimate and it is always difficult to identify the authenticity and at the same time, it is harder to recover money. Online gambling addiction is also known as "impulsive-control disorder" which defines that the person cannot control the impulse to game even though the outcome is negative. According to the Diagnostic & Statistical Manual of Mental Disorder (DSM-5), the American Psychiatric Association uses the clinical term "Pathological Gambling" in terms of gambling addiction. The association also states that people are addicted to online gambling as they want to earn a heavy amount of money, chasing losses (earning back the loss amount) for their excitement, avoiding personal problems and temporary improvement of mood etc. As a result, they spend more and more time on the internet and avoid their family, friends and associates. Both personal and professional life of the online gambler is affected which causes health issues like: stress, depression, panic disorder, personality disorder and consumption of drug, alcohol and nicotine. In extreme cases, the person hurts the family, creates domestic violence and may kill others or accept suicide.

- **Adopting different Avatars & hide from real situation**

By applying digital Avatar people behave differently on the basis of the character. They play the role of digital male and female which invites "stereotype threats''. When a male plays a character of a digital woman his behaviour has changed accordingly and reverse is also applicable. There is also a concept of "stereotype boost" which has positive results, but in many consequences people are habituated to play the virtual role rather than avoiding their actual character and responsibilities. The online players playing the character of male avatar were more likely to engage in killing whereas the female avatar were more likely to heat (Schultz, 2014).

- **It is not desirable unless practised for a noble cause**.

The use of the internet is today's need, but the addiction of it is not desirable for the people and society. The main aim relates to online playing is to make the game interesting rather to show the seriousness. Similarly, use of the internet makes the work effective, not to avoid the work. The persons take online activities as their daily part of life to make the life lively and smooth. It does not mean to separate from real life and associate with the virtual set-up which makes people addicted and escapist (Calleja, 2010).

- **Escapism vs digital escapism**

Escapism refers to getting relief from an unpleasant situation or going away from realities or the tendency of distraction. It can be the association of virtual world or the world of fantasy which is not the part of practical life. It is the self away from present depression and sadness. Digital escapism is the platform where the people who are internet addicted spend more and more time in social media and not focus on the real world. Even they are unknown about the happenings with themselves and their family members or their peers. Here the example of COVID-19 Disaster can be given. The release of both the games "Nintendo Switch" and "animal crossing: New horizons" have given the platform of entertainment and escapism which is helpful not to be depressed and tense due to lockdown and shutdown along with quarantine in COVID period (Warren, 2020).

- **Digital escapism age groups**

Not only youth but also all age groups are associated with online gaming and gradually they are addicted with this. As a result, they suffer from psychological problems (Kardefelt-Winther, 2014). In this modern era of smartphones and computers people easily access the internet for various purposes like: shopping, gaming, gossiping, entertaining etc. by each and all age groups. The media platform is heavily used by all. Most of the people use internet as a medium of pleasure, leisure, passing of time and avoiding the present circumstances of trouble or pain. Knowingly or unknowingly they are being trapped by addiction. At the same time, brands are attracting the consumers to offer more interesting platform in which they can be emerged completely. They concentrate their total attention on virtual sphere and slaves of addiction. It may be the case of a child playing video games, youngsters sharing videos or watching monies or the case of senior citizens on news updates and gossip with Facebook friends all are connected with and totally dependent on internet. But the addiction creates issues in relations of all age groups specially young mass and affects real lives. Escapism is alluring if people stay safe and within control, but controlling or reinforcing is a myth in many cases of online addiction or online escapism (Kemp, 2017).

- **Escapism is a syndrome or normal phenomena**:

Online escapism is also known as Internet Gaming Disorder (IGD) as the online players spend more time on e-sports rather than recreational games. They are motivated to make more score and compete to win. They love to enjoy virtual association and playing mates which invites the syndrome of escapism. It creates anxiety, stress, depression, burn-out and severe change in behavioural pattern and affects family, personal and professional set-up. Escapism has negative outcomes as it ruins the career and life of a person who is addicted to net and gaming disorder. It puts the e-sportsman in a traumatic condition or they may face physical and mental injury. But it has a positive aspect of skill development and motivation if the user of the internet is the self-controller. If online game or e-sports etc. are used for entertainment purpose which make the people refresh then it can be considered as a normal sign of escapism, but if the user is emerged in it by staying stable in virtual world without considering the real world then online escapism is a syndrome (Bányai, Griffiths, Demetrovics, & Király, 2019).

Impacts of Digital Escapism

Human beings live in society and depend on each other. They value relations and love social interactions to fulfil the need of mental happiness and enjoy the pleasure of togetherness. Therefore, the internet is the only source of instant communication through video conferences, WhatsApp, twitter, Facebook, email etc. The Virtual Reality (VR) has a great impact on day-to-day life and it also helps to omit loneliness by providing different platforms of enjoyment and entertainment. But, spending more time and excessive dependence on the internet invites negative issues like: addiction of the internet, escapism, belief in virtual association and ignoring the real world. The VR provides a platform of excitement and relaxation of mind which takes away people from their own family, peers and relatives and makes them escapist (Siricharoen, 2019).

Playing online video games or other sports are the means of living virtually and escaping reality. These provide a more interactive, competitive and exciting platform than watching the movie or reading the book. The games consisting of different series motivate the players to spend heavy time on sports which takes them in the world of whim magic and fantasy. A perfect online game provides an innovative and skill development platform to its consumers rather than trapping them psychologically and humiliate them emotionally which bring enormous changes in the behaviour of e-sportsman. Hence, the failure of "No Man's Sky", "The Freedom of EVE Online" and the "Wander of The Legend of Zelda" are the warnings to change in the trend of online games. The expansion of modern online game industries which has slightly changed the hyper-realism, more realistic and fall of magic will provide happiness and enjoyment to the e-sportsman rather than be called as escapist and as long as there are online games to play it is not over (Koecher, 2016).

- **Digital escapism during COVID 19**

The age of the internet brings online escapism, which is an unavoidable hubby of spending more and more time on the internet and called as internet addicted. People share little time with their family members and relatives, but they are more engaged with online games, e-gambling etc. Excess hobbies bring online escapism as they are more careful for virtual rooms rather than actual homes and do not prefer to solve math related problems or enhance knowledge, but put more effort into slaying a dragon. Hence, during COVID-19, people are locked at homes and spend heavy time on the internet. According to the report of American Psychiatric Association 160 million adults in US play online games and 0.3%-1.0% adults face issues like: Internet Gaming Disorder (IGD). This disaster of Coronavirus also gives a platform of healthy escapism through online entertainment and they spend their lives with social distancing and passing of time (Wilder, 2020).

- **Reverse engineering happened during a pandemic situation. People came out of escapism practices because of exhaustive time they spend on digital platforms.**

Information Communication Technology (ICT) plays a very vital role by leveraging its power and utilizing it in the Public or Government sector to make the city smart, in the private sector to achieve business goals and fulfils the want of a better life by balancing both personal and professional lives during COVID-19. The Internet maintains congruence in personal life, business operation and urban management. It develops architecture to gain general knowledge and improve performance in anywhere (Hattingh et al., 2020).

COVID-19 has brought social recession which hits basically certain groups like: differently abled persons, senior citizens and the people live alone. As the pandemic is continuing for a long period, the internet is the only source for these communities along with all others. The

slow level of escapism is good for both mental satisfaction and passing the time without boredom. The virtual room is simply an escape from the real home or even the practical world, but during the COVID period it acts as reverse engineering weapon which is useful for news updates, online shopping, entertainment, e-banking, e-sports, online teaching and many more and not just regarded as escapist. It is helpful for the entire universe if it is used for a novel purpose (Roose, 2020).

Conclusion

Escapism will continue as it becomes part of the practice behaviour of human beings since a long time ago. It is not always a bad thing to have escapism, but for a long period diverting from the main goal in life is definitely negative. The term "digital escapism" has both positive and negative effects on the life of users and society. Everybody in this world wants happiness and satisfaction by fulfilling the desires or needs. People prefer pleasure to pain. They easily want to skip over unhappy and sad incidents and situations. Therefore, they engage themselves in different activities like: playing video games, watching movies, reading novels, online shopping, making chatroom friends, doing e-research and conference with family, relatives and friends etc. with online associations. All these aspects help to pass the time of the user along with giving pleasure to the user. The working from home, online teaching and banking aspects also make life easy even in the COVID period. But excess dependence on the digital world and going away from the real universe has a negative effect on the user. It is a fact that the user is gradually addicted to virtual associations and forgets about his/her goals, duties and responsibilities. Online multiple games, online gambling, online friend groups and many other internet peers are the vita sources of digital escapism. In the Covid period when there is social distancing and no outdoor activities the young mass are engaged in internet activities for more time than earlier. The youth away from the eyes of parents and living in separate rooms sometimes go wayward through online play rooms and chat rooms. The users, when addicted, would always love to live online and leave the reality. It creates "Internet Disorder syndrome" or "Digital Escapism '' which invites stress, depression, deviation from own goal, sleeplessness and anxiety. Hence, everything excess means over-utilization which brings issues and reduces satisfaction. So, self-control and self-help are two important methods not to be digital escapists. It is preferable to travel in digital world for a noble cause rather to be victimised. Digital escapism to a controllable limit brings pleasure, but addiction of internet or digital escapism ruins the life.

Competing Interest Statement

All authors have read and approved the manuscript and take full responsibility for its contents. No potential conflict of interest was reported by the authors.

Acknowledgements

The authors would like to thank the reviewers and editors of this manuscript. Authors acknowledge the financial support from ICSSR – IMPRESS project fund of Govt. of India.

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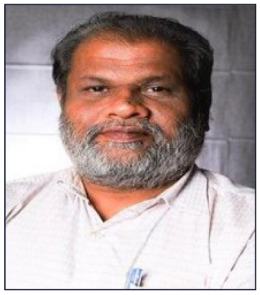

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Horizon J. Hum. & Soc. Sci. 2 (S): 45 – 52 (2020)

Journal of Humanities and Social Sciences Research
www.horizon-JHSSR.com

ORIGINAL ARTICLE

Digitalisation, Online Learning and Virtual World

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ARTICLE INFO

Article history
Received: 26-Jun-20
Revised: 25-Sep-20
Accepted: 29-Sep-20
Published: 15-Oct-20

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ABSTRACT

The objective of the paper is to analyse the process of digitization, progress and challenges of online teaching and learning. The paper is based on secondary sources of information and data. The digitalisation has influenced the social and economic activities of the world drastically. Educational practices and policies, particularly, online teaching and learning has emerged as consequence of digital turn. Online education has a pedagogical shift in teaching and learning methods. However, online learning is a new form of distance learning, which has following types:

1. Correspondence Courses, 2. Tele-courses 3. CD-ROM Courses 4. Online Learning through ZOOM, Skype, Google Meet 5. Mobile Learning through WhatsApp etc. Online learning is capable of satisfying the requirements of increasing student population who cannot join in traditional classrooms. The benefits of online teaching and learning are (i) Convenience (ii) Enhanced Learning (iii) Bridging regional gaps (iv) Interaction (v) Innovative Teaching (vi) Improved Administration (vii) Savings (viii) Maximisation of Resources (ix) Outreach. The education sector is adopting online education system and virtual classes are the best solution to protect the students from spread of corona virus.

Keywords: Internet, New Normal, Online Learning, Teaching, Users, Virtual World.

Introduction

The corona virus pandemic has disrupted the traditional class room education system of learning in the entire world. In the age of digitization and internet, there is paradigm shift to online teaching and learning for physical distancing of students as a safety measure for corona virus infection. Digitalisation implies to the activities in social and economic life which are restructured around digital communication. The digitalisation has influenced the social and economic activities of the world drastically. A 'digital' or 'virtual' world is the reality due to the quick spread of Internet, computers, laptops, tablets and smart mobile phone within last 20 years. Educational practices and policies, particularly, online teaching and learning has emerged as consequence of digital turn. Digitalization reflects the characteristics of contemporary modern society. The digital revolution has made this world a village. The planners and policy makers emphasize on robot technology, artificial intelligence, the protection of information and data, education, banking, democratic electoral process, etc in close relation with digitalisation. The digital movement significantly influences different teaching and learning methods, policies and practices. The online methods of teaching and learning have gained rapid momentum in recent years, particularly after outbreak of corona virus. The new, digital media are omnipresent everywhere. The digital media and communication have become the new normal. The political changes including election campaign are extensively using social online platforms and media such as Facebook and Twitter which influence the public strongly. In this context the objective of the paper is to focus on online teaching and learning with benefits and limitations. The study is based on purely secondary data and information.

Online Learning

Online teaching and learning refers to education, which distributes knowledge between the students and teachers over the internet. This is also called as "e-learning" and sometimes called as 'distance learning'. It is estimated, that the e-learning market size in India was 247.00 million USD in 2016 and the number of users are 1.6 million. The online learning market shall witness significant growth which may touch 1.96 billion USD and the current user may increase at 44 percent with number of users at 9.6 million by 2021. The e-learning market in India is after the USA is estimated to be the second largest. It is expected that the growth rate of India's e-learning market will be 15.64 percent and exceed $48 billion by 2020. Due to significant growth in internet and smart phone penetration both in rural and urban areas in India, the online education is gaining momentum. The number of internet users was 432 million in 2016, which is expected to be approximately 730 million by 2020 almost double in four years.

Online teaching and learning is the modified form of distance education system which is most popular in modern times for those who can not attain traditional classroom. After the outbreak of COVID-19, all universities, colleges and schools have started online classes as the only method of teaching which completely substituted traditional class room type of teaching. The trend of online teaching, training, seminars and conferences is increasing significantly during last few months. Knowledge and information are accessible almost at any time and any place. This online learning create opportunities but also risks for educational practices. Social media is new form of diverse educational activities. University Grants Commission (UGC) in India has started open online courses (MOOCS) which are regarded as the new methods to democratize higher education. Online or Distance learning has a long history, which was suitable for service holders and people residing at far-off places. There are several types distance learning available today which are as follows:

- *Correspondence Courses which are conducted through regular mail/post of study materials with little interaction between the teachers and students.*
- *Online learning which Internet-based courses are offered by educational institutions.*
- *Tele-courses in which lessons are delivered to the students with the help of television broadcast or radio.*
- *CD-ROM Courses in which the students regularly interact with contents of static computer.*
- *Mobile Learning which takes place with the help of digital audio players (I Pods,MP3 players) cellular phones and PDAs.*

After COVID-19, the most popular approach of education in schools and colleges today is online learning. Even if some online teaching classes are almost similar to self study independently by students but most online classes are not classes which are self-paced. The regular assignment, screen shared materials and interaction between teachers and students reflects "regular" class feeling. The online teaching and learning saves time in travelling by students and teachers to the class room. The syllabus and courses in online teaching and learning class is same to that of a traditional face to face class in a subject. Of course high speed uninterrupted internet is essential for online learning. Students in remote rural and hilly areas do not have access to internet and face problems in online learning. The following characteristics are observed in case of most successful online students/ teachers.

1. Self starter and self motivation
2. Familiarity with computers and Internet
3. Time-management skills and Good organization
4. Answers and solutions to questions and problems resourceful and actively

It is observed that enrollments in online teaching and learning is rising at faster rate than for the growth of student population. The colleges and Universities are offering more and more online courses over time. For example, massive online courses of UGC are very popular in India and students are downloading lessons, e-texts and videos from e-pathshala. It is estimated that 53.6% of the schools stated that online education is adopted as their plan and strategy for long run for future. Many academic leaders believe that the quality of traditional class room with face to face interaction between students and teachers is less than online learning and they have argued that online teaching is superior. Many colleges and Universities have created "virtual classrooms" and smart class rooms with all digital instruments for online teaching. Course Management System (CMS) software is very popular in colleges. The teachers formulate and design their lessons and courses and teach within a flexible framework to enable learning and communication to occur frequently and systematically. Online learning is leading to a significant shift in teaching and learning process. Such online education for passive students has become more collaborative and interactive in which students and teachers co-create better learning process. The changing role of teacher from the "sage on the stage" to

"the guide on the side" is visible and remarkable in online learning system.

Facts and Statistics of Global Online Learning Industry

Although it has been practiced for decades, online learning may be described as relatively the newt form and mode of distance education (Stern, n.d.). Online education has paved the way for a significant dramatic shift in the methods of teaching and learning. In e-learning process teachers, trainers and instructors act as guides and the learners are collaborate properly than listening passively (Stern, n.d.). Some important facts and statistics are stated below to assess the popularity on online learning.

1. Online learning is considered and as very safe and secured for students and teachers that is the only viable option for continuity of education during the COVID-19 pandemic. The outbreak of corona virus reduced mobility and created physical distancing among people for which personal face to face interaction is not safe and e learning turned personal and professional worlds upside down. The global e-learning market was already seeing a massive annual global growth even before the pandemic. The compound annual growth rate (CAGR) of online learning shall be 9.1% from 2018 to 2026 (Syngene Research, 2019). It is expected to reach $336.98 billion by 2026. The growth estimates are likely to increase due to the Corona Virus pandemic.
2. The USA, China, India, South Korea and United Kingdom are the front running countries to invest more in e-learning (Dos Santos, 2019).
3. Approximately 59 percent of the U.S. e-learning share of market is coming from content related online learning products (Technavio, 2018). The growth of online education in the USA is due increasing patronage among students. As per one estimate, more than 30% of American students are enrolled in at least one online course (Palvia, et al., 2018).
4. Nearly 99% of the students studying in undergraduate degree programs online are physically located in the country (Palvia, et al., 2018). A popular survey revealed that 52% of graduate students in the U.S.A. revealed that compared to their college-level classroom education, online college-level education to provide a better learning experience (Duffin, 2019).
5. In the European Union the e-learning market is led by Germany (Statistics Market Research Consulting, 2019) which is growing at a rate of 8.5% annually, while the country's economy continues to grow at around 1.9% (Michel, 2018).
6. A report of the European University Association stated that the main objective of the Higher Education in Europe is to use online teaching and learning for improving the quality of higher education rather than replacement (Gaebel, 2015).
7. The percentage of students opting one or more online UG classes increased from 15.6% in 2004 to 43.1% in 2016 (Snyder et al, 2018). The percentage of graduate students who took entirely online graduate (postgraduate) degree programs has increased from 6.1% in 2008 to 27.3% in 2016 in USA.
8. The percentage of undergraduate students adopting full online degree educational programme increased from 3.8 percent in 2008 to 10.8 percent in 2016. The percentage of graduate students who take one or more online courses also increased from 16.5 percent in 2008 to 45.6 percent in 2016.
9. So far as gender is concerned, there are more female students online higher education classes than males in general. It is interesting to note that in USA 65 percent of undergraduate and 54 percent of graduate online students is female (Duffin, 2019).
10. Another interesting findings in USA is that86% out of 1500 graduate students from online classes believed that the learning value obtained by them from their online degree equaled or exceeded their payment. For a master degree or doctorate degree, online learning and guidance is also preferred.

Benefits of Online Teaching and Learning

Online teaching and learning in distance mode suits to the requirements of increasing student population who prefer learning sitting at home without participating in traditional class room. These students who are unable to participate traditional face to face class generally do not get admission in a particular class at their preferred institution or live in remote locations from where traveling to the institution is not feasible and work full-time or those students who generally prefer self study to learn independently. Easy computer access, the internet connectivity, and the motivation to succeed in a virtual non-traditional classroom are the minimum requirement for students to join and participate in an online course. The online courses facilitates excellent method of delivering lessons to students which is not restricted by any location or time and it allows both teachers and students for accessibility from anywhere at any time. Due to busy lives of many learners, the online learning is a convenient way and suitable. A tremendous incentive and motivation

for many of the students in digital world is the ability to access lessons and course from any computer with Internet access, 24 hours in a day and seven days a week which are the main benefits of online learning. Some key benefits of online teaching and learning are as follows.

1. **Convenience:** The student finds it convenient due to access throughout the day at any convenient time from any computer within their bust schedule.
2. **Enhanced Learning:** Online learning also increases depth of understanding, remembering and retention of course content. It leads to more meaningful and fruitful interactions and discussions, enhancement of technology skills, life skills like time management, independence, and self-discipline.
3. **Shy students:** The shy students with less communication ability tend to find convenient and feel better online. Students can take more time to think and reflect before communicating.
4. **Interaction:** Online learning increases interaction and discussion between the teacher and students. Learning environment becomes more student centric which reduces passive listening thereby promotes active learning and connectedness.
5. **Innovations in Teaching**: Online learning increases variety and creativity of activities and styles related to learning. On ground courses are also improved.
6. **Improvement in Administration:** The teachers and instructors get more space and time to evaluate student activities more rigorously and thoroughly. It becomes easy to document and record online activities and grading is easier online.
7. **Savings:** Online teaching does not require limited class infrastructure like desk and benches for which more students can be admitted to a programme. This also leads increased satisfaction of student, higher retention and less repeats.
8. **Physical Resource Maximisation:** It reduces demand for campus infrastructure, decrease congestion on campus and parking of transport vehicles.
9. **Outreach:** Online teaching gives more options to students, reaches new student markets which increases student enrollments in educational programs.

Internet users and Online Learning

The Internet has made the world into a global village in which the interaction and socialization of people and assessment of information and entertainment are promoted. It is a major source of news and entertainment, trade and commerce. The search engine Google which is most popular empowers the company in a hugely influential position. Online social networks are very popular in developed and developing countries. Social media like, Facebook, WhatsApp, LinkedIn, MySpace, Bebo, Pinterest and Twitter are very popular social media and phenomenon. The most popular social media, Facebook has 829 million active daily users. The World of Warcraft (WoW) has subscribers which is estimated as 77 million (Karmali,2013).The proportion of internet users worldwide is given in Table-1.

The percentage of internet user in increasing significantly over time. More than half of the world's population (53.6 %) are using internet in 2019. While internet user is 86.6 % in developed countries, it is only 47 % in developing countries. Within a period of 14 years from 2005 to 2019, the internet user worldwide has increased from 16 % to 53.4 % which reflects the popularity of internet among the people. The trend of internet users is shown in Figure-1.

The internet users in African countries are found to be less compared to other regions. The internet users by region is displayed below in table-2.

Europe has 82.5 % internet users followed by America with 77.2 %, Common wealth States with 72.2 %, Arab states with 51.6 % and Asia and Pacific with 48.4 % internet users in 2019.

The fig-2 indicates that European countries have highest percentage of internet users but trend of increase in internet user is more significant in America.

The region wise internet users with fixed and mobile subscriptions are shown in table-3.

The mobile internet users are significantly more than fixed land line internet users in all regions.

Effectiveness of online Learning

It is evident that online learning can be more effective in many ways. Many research studies have proved that

Table-1: World Wide Internet Users

	2005	2010	2017	2019
World Population (in Billion)	6.5	6.9	7.4	7.75
User worldwide(%)	16	30	48	53.6
Users in the developing world(%)	8	21	41.3	47
Users in Developed world(%)	51	67	81	86.6

Source: International Telecommunications Union.

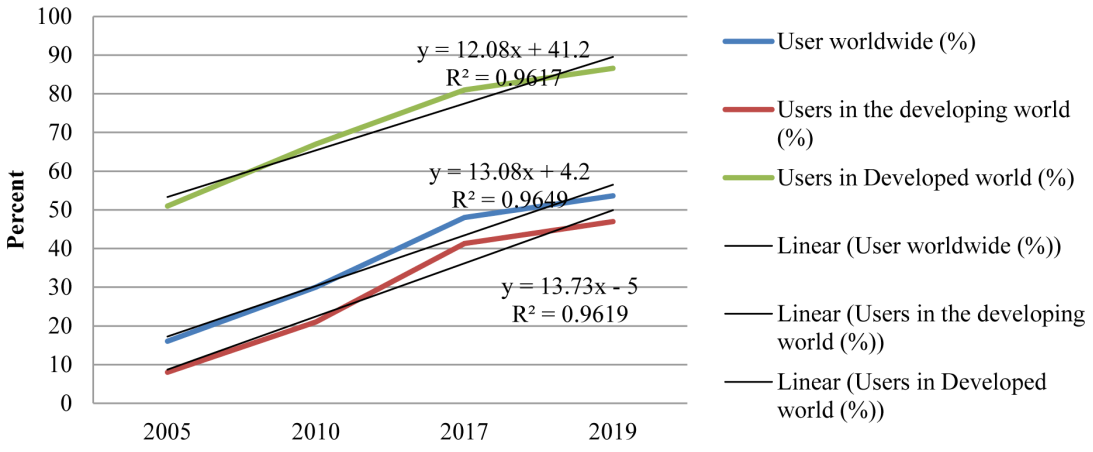

Figure 1: Trend of Percentage of Internet Users

Table-2: Internet Users by Region

	2005	2010	2017	2019
Africa	2	10	21.8	28.2
Americas (%)	36	49	65.9	77.2
Arab States (%)	8	26	43.7	51.6
Asia and Pacific (%)	9	23	43.9	48.4
Commonwealth of Independent State (%)	10	34	67.7	72.2
Europe (%)	46	67	79.6	82.5

Source: International Telecommunications Union

Table-3: Region-wise fixed and mobile Internet Users

	2007	2010	2014	2019
Fixed subscriptions: (in %)				
Africa	0.1	0.2	0.4	0.4
Americas	11	14	17	22
Arab States	1	2	3	8.1
Asia and Pacific	3	6	8	14.4
Commonwealth of Independent States	2	8	14	19.8
Europe	18	24	28	31.9
Mobile subscriptions: (In %)				
Africa	0.2	2	19	34
Americas	6	23	59	104.4
Arab States	0.8	5	25	67.3
Asia and Pacific	3	7	23	89
Commonwealth of Independent States	0.2	22	49	85.4
Europe	15	29	64	97.4

Source: International Telecommunication Union

students understand and retain 25 percent to 60 percent more study materials on an average in online classes in comparison to only 8 percent to 10 percent in a classroom. The students are able to learn faster online than traditional class room. E-learning needs 40 percent to 60 percent less time than in a traditional classroom because students can learn at their own convenient location as they choose and in mutually agreed time. It is clear that

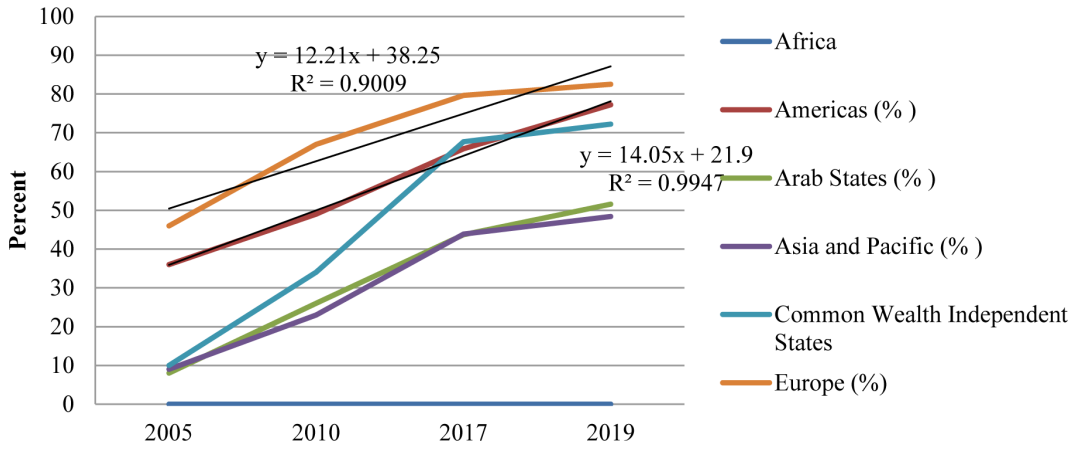

Figure 2: Trend of internet users in different Region

effectiveness of online class varies with age of students. Since kids and young school students are more easily distracted, online class appears less effective at early age but it is more effective for higher school and college education. Since studies have shown that children prefer computer and mobiles to learn, which makes learning fun and effective by using technology.

COVID-19, New Normal and Online learning

The COVID-19 pandemic has given a big boost to the virtual world. The long-term implications shall go far beyond zoom-calls and virtual summits. It is observed that the connected world has become even more connected through virtual face-to-face interactions. The available data show a 32% increase in total broadband traffic, 38% and 40% increases in streaming video and VPN usage respectively, and a 212% increase in VOIP and video conferencing. This is not just a reaction to the crisis, we are virtual social creatures now and we will never completely go back to the way it was before. Corona Virus outbreak and restriction on movement by Government has forced the people to do official work from home instead of coming to office to stop the spread of the virus. During such pandemic period, virtual reality (VR) is a strong alternative to video calls and smart communications. The people have preferred virtual communication as a long-term strategy which can promote and facilitate business and trade.

It is a fact that education is the shortest bridge between the rich and poor which can bring more welfare and prosperity for individuals and countries. The current education system through internet has been adopted by more students in developed countries and slowly it is getting acceptance by students in developing countries. The important facts on education system are as follows.

1. Our current traditional class room system of education is structured on the basis on the industrial revolution model, memorization, retention and standardization.
2. There is need to regular updating of syllabus and education system with readiness of job. The employable students must have ability to compete against smart machines and to create economic value in long run.
3. The accessibility by all students, equity and quality of education need to be improved to solve the global education crisis.

After COVID-19, particularly the traditional class room education is in serious crisis. Before the coronavirus pandemic outbreak, many children were out of schools due to extreme poverty and lack of resources. Quality education is most important along with skill-based training for employment. Two important issues of education are (i) Access (ii) Equity. Access refers to providing easy and equal opportunity to all deprived and privileged student learning population. Establishing schools and college within the reachable distance of students increases the access to education. It is low in many developing countries. Equity refers to ensuring every child has the required resources to go to school and to stay in any circumstance. It is important for us to see that in post-COVID-19 situation, the investment in online education increases significantly. This corona pandemic has made online teaching and learning compulsory for dissemination of knowledge across all regions and borders. If online learning technology can play a strong role in society, the educational circumstance will change significantly.

Online Learning for Higher and Secondary Education

The Higher education sector is seriously affected by the COVID-19 pandemic. Even if many higher education institutions have shifted to online learning but conducting practical in laboratories by students are not possible in science subjects. Some important facts regarding higher education are as follows.

1. It is predicted that the corona virus pandemic may lead to a six months to five years disruption in higher education (Dennis, 2020). Another prediction states that there will be a 15 percent to 25 percent decline in enrollment in higher education (Dennis, 2020).
2. A report revealed that the student enrollment post-secondary education shall witness a yearly decline of 1 percent to 2 percent while the number of students taking online courses will grow 5 percent annually. (A joint report by the Boston Consulting Group and Arizona State University, 2018).

The growth of online teaching and learning will increase exponentially in the upcoming academic years in all countries of the world. If online learning is made compulsory, there is possibility that traditional online courses and massive online courses may have dramatic changes over time. Although they may look similar to each other, these online learning modules are actually different. .The teachers and instructors facilitate these online courses. Traditional online courses are based on requirements and guidelines of traditional courses including lecture schedules and assignment deadlines (Sarmah, 2019). In Massive

online courses, lectures are pre-recorded and accessible at anytime by the students. There is no deadline for completion of a MOOC and the course teacher need not come from a college or university (Sarmah, 2019). The online courses in post-pandemic period has many advantages traditional courses. Therefore, all countries must plan and prepare themselves for online teaching and learning in schools and colleges.

Conclusion

The Indian education system is criticized for outdated curriculum, cost of education, quality of teachers and lack of infrastructure. E-learning has a promising future which can solve many problems of Indian education system. It is a fact that online teaching and learning cannot completely replace traditional interaction and teaching for which blended learning which is a mix of online and off line education can suit well to developing countries including India. The course delivery and easy access by student to online education will act as a change-agent in shaping up future education. Students have to attend schools and colleges to complete their education under present education system in India. Although the conventional model is the commonly accepted mode of formal education across the world, the education fraternity is opening up to online education or e-learning. Everything is going online and, so is education. Access to the internet currently makes knowledge ubiquitously available. The intensity with which digital media have become entangled with our everyday lives is astonishing, although we do not seem to realize it any more. Digital media have become the new normal form any citizens throughout the world. Many of us are almost permanently online, for reasons of work, of leisure, of community building, friendship and family formation. Media is ever present, but at the same time also invisible. The only time we notice media is when it does not work. Virtual/ networked learning communities may transform practices of adult education. Open source communities, making use of open source software, create new opportunities of free knowledge sharing and joint knowledge production. The rapidly falling costs of the production and distribution of digital information, enables peer production to compete with market mechanisms of producing knowledge and culture.

Competing Interest Statement

All authors have read and approved the manuscript and take full responsibility for its contents. No potential conflict of interest was reported by the author(s).

Acknowledgements

The author(s) would like to thank the reviewers and editors of this manuscript.

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Horizon J. Hum. & Soc. Sci. 2 (S): 53 – 58 (2020)

Journal of Humanities and Social Sciences Research
www.horizon-JHSSR.com

ORIGINAL ARTICLE

COVID-19 Crisis: A study on the Missing Woman in Benefit Transfer through PMJDY

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ARTICLE INFO

Article history
Received: 26-Jun-20
Revised: 25-Sep-20
Accepted: 29-Sep-20
Published: 15-Oct-20

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ABSTRACT

During COVID-19 pandemic lockdown government of India announced a policy of direct cash transfer to women PMJDY (Prime-minister Jan-dhan yojana, a Govt. of India scheme on financial inclusion) bank accounts, Rs.500/- for a period of three months April-June 2020 to all 0.2 billion women PMJDY accounts holder. This study is to find out the missing poor women in PMJDY bank accounts, and to discuss the causes of exclusion, limitation of the policy to achieve the goals. Since the success of distribution of benefit transfer through PMJDY account is mainly depends upon the Indian banking system efficiency to meet the urgency cash transfer during lockdown. Literature reviewed to find out present status of Indian banking system. Authors are conceptualized a mathematical research model for the development of objective and hypothesis of this study. PMJDY bank account of women is taken as dependent variable. DBT, density of rural bank branches and, digital payment authentication systems are taken as independent variables. COVID-19 impact is taken as the control variable for this study. Due to COVID-19 pandemic social distancing norms, only secondary data are collected for analysis and hypothesis testing. These data are taken from government PMJDY portal, FII-2018-survey (PPI-Index), and World Bank's estimates. During disaster or pandemic, government policy should be for all. Because during pandemic, every individual of the country was impacted. Supply of Adhar based digital authentication payment machines can improve the transparency and optimal utilization of government relief fund. Since this study has been done after COVID-19 lockdown, so analysis are done by taking only secondary data from government websites, and reports, and survey.

Keywords: COVID-19, Pandemic, PMJDY, DBT, Digital Payment, Relief Fund, Aadhar.

Introduction

The relief package was announced by Indian union finance minister, Ms Nirmala Sitaraman, on 26th march 2020 in response to Coronavid-19 pandemic lock down. It is correctly compliments with cash transfer to the list of women using PMJDY (Prime-minister Jan-dhan-yojana, a Govt. of India scheme on financial inclusion) account, and food rations. Some people say, during any pandemic gender biasness strategy of the government is not correct while distributing relief packages. Due to lockdown several people were bound to become jobless. So they now become poor and excluded from this benefits, since they do not have PMJDY account earlier. This creates a huge disappointment among excluded people.

Government policy of benefit transfer

During COVID-19 pandemic lockdown government of India announced a policy of direct cash transfer to

 DOI: https://doi.org/10.37534/bp.jhssr.2020.v2.nS.id1070.p53

women PMJDY bank accounts, Rs.500/- for a period of three months April-June 2020 to all 0.2 billion women PMJDY account.

Statement of problem

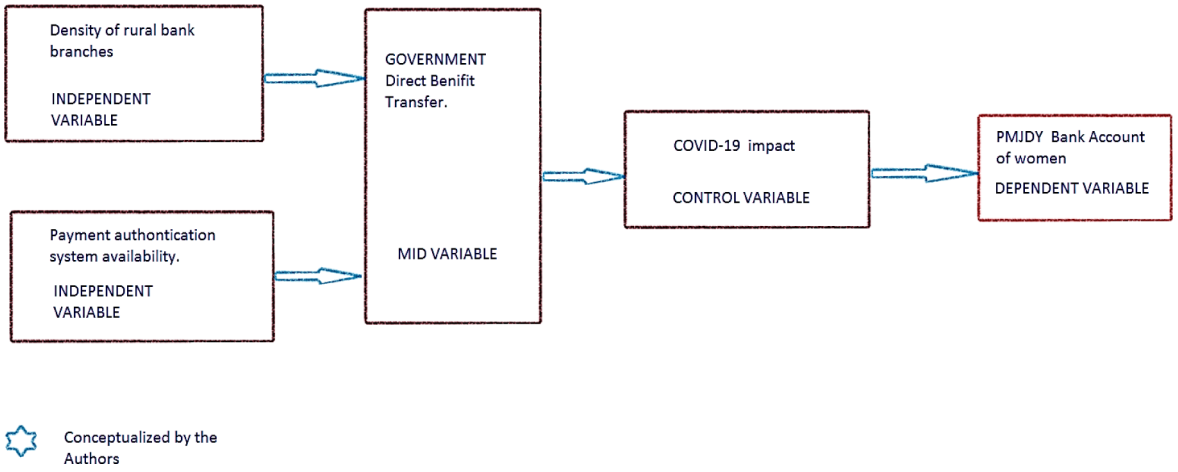
Some nationally representative household surveys done after lock down and government data are not sufficient to find out the real house hold coverage of this policy package due to several reasons. This study has been done to find out the excluded cash relief coverage of this policy due to its certain limitations.

Historical background

Since the success of distribution of benefit transfer through PMJDY account is mainly depends upon the Indian banking system efficiency to meet the urgency cash transfer during lockdown. Literature review has been done to find out present status of Indian banking system.

Year	Authors Name	Prospective on Banking financial services.
1988	OCC Report[8]	This report identified the reasons of banking system failure during 1980 and highlighted the fact that, economic slowdown and poor banking management policy are the reasons for banking system failure.
1996	Deolalkar[1]	Indian banking system has started giving credit loan, with less risk, due to this growth of banking system are not visible. Banking services are penetrates lessin rural areas compared to urban areas.
1998	Milanovic[2]	In this world bank report it was highlighted that due to the fall of communism and rise of capitalism, in 18 countries in the world were affected by the income level gap between rich and poor.
1999	Morduch (1999)	The author analyzed Grameen banks financial statements and found that these banks were managed to get profit by providing subsidy to their customer.
2004	Rishi et al.(2004)	Authors have found that to deliver the banking services in cost effective manner, technology is an important tool.
2004	Barr (2005)	Authors highlighted that poor people have less access to banking services, which force them to be a migrant labour, and force them to stay away from their family.
2010	BCG-FICCI report (2020)	This report gives suggestion that to serve the wider consumer base it is essential to increase the use of net banking, and installations of 'ATM' in rural areas.
2015	Parker and Sachdeva (2015)	Authors said modification of existing infrastructure of banks can improve the commercial viability of banks.
2016	CVR Rao et al. (2016)	Authors analyze the success of PMJDY scheme, and found that it has got a vital role in economical development of the country.

Mathematical Research Model



The above mathematical research model was conceptualized for the development of objective and hypothesis of this study. PMJDY bank account of women is taken as dependent variable. DBT is taken as mid variable, density of rural bank branches and, digital payment authentication systems are taken as independent variables. COVID-19 impact is taken as control variable for this study.

From the above variables our objectives are chosen as follows.

Objectives

- To find out the missing poor women in PMJDY account.
- To discuss the limitation of the policy to achieve the success.

Hypothesis

Ho- There is no exclusion of poor women in distribution of COVID-19 cash relief.

H1- There exist some exclusion of poor women in distribution of COVID-19 cash relief.

Methodology

Basically, due to COVID-19 pandemic social distancing norms, only secondary data are collected for analysis and hypothesis testing. These data are taken from government PMJDY portal, FII -2018-survey (PPI-Index), and World Bank's estimates.

Data

Table 2: Indicators of PMJDY

Sources of Data	Values of the Indicator
PMJDY portal, April 2020	Total number of PMJDY accounts = 382.3 million
	Total number of rural /semi urban PMJDY account = 226.7 million
	Total number of female owned PMJDY accounts = 207.2 million
WORLD BANK estimation report 2018	Total number of adults (above 15 years of age) = 986.7 million
	Total number of adult female (above 15 years of age) = 475.8 million
	Percentage of population living in rural areas = 0.66, 66%
2018, FII Survey	Percentage of poor women among all adult women = 0.69, 69%
	Percentage of PMJDY accounts holder poor women = 0.75, 75%
	Percentage of all adult do not possessing a PMJDY account = 56%
	Percentage of adult poor women does not possess a PMJDY account becomes 43%.

Data Interpretation

Assumptions taken by authors for hypothesis testing are mentioned as below.

- No one from the population has two PMJDY bank accounts.
- Across the adult population, the PMJDY bank accounts are normally distributed.

Basing on the above assumptions and the data from table 2, PMJDY portal, April 2020, the total number of PMJDY accounts are 382.3 million, and total number of female owned PMJDY accounts are 207.2 million. As per WORLD BANK estimation report 2018, total number of adults (above 15 years of age) are 986.7 million, and total number of adult female (above 15 years of age) are 475.8 million. From 2018, FII Survey PPI, percentage of poor women among all adult women =0.69, 69%, and percentage of PMJDY accounts holder poor women are equal to 0.75, 75%. Now percentage of all adult, not possessing a PMJDY account are 56% and adult poor women does not possess a PMJDY account are 43%.

Now using z test for Proportion **>** .43, for value, $\alpha = 0.05$, with 95% confidence and 50% favourable out comes (assumed for survey data) one side right tailed test,

$$Z = \frac{(\hat{p} - p) / \sqrt{pq}}{n} = 2.03, p = .43, q = .57$$

Decision obtained

Since Z value is 2.03 which is much greater than z statistical value 1.645, our null hypothesis is rejected and some exclusion in benefit transfer is proved.

Findings and Suggestions

Due to COVID-19 pandemic it is not possible for women account holder to reach the ATM or the banks near to them. More than 43% women poor people are under exclusion for this. Government Survey also suggest exclusion under not having any women PMJDY account in a house hold. So these limitations in government survey force some amount of exclusion in benefit transfer under COVID-19 cash relief. As per FII-2018 survey within 1 km distance financial services available for each individual is approximately 28 numbers of bank branches, 22 numbers of ATM machine, 13 numbers of banking agent or correspondence and 8 numbers of Adhar linked ATM

for authentication and digital gate way payments. Due to the gender biasness of government policy COVID-19 relief transfer, several poor are not able to reach financial institution for cash collection due to pandemic situation and not avail the cash transfer from government. So our suggestions government should take necessary steps to include them under PMJDY scheme to give them cash relief to meet COVID-19 pandemic crisis. Another point digital authentication payment should give priority to avoid miss-utilization of relief fund. Lastly the amount is only Rs.500/- per month for three months, which is very little amount to fulfill their essential need during pandemic. Because of the COVID-19 lock down several migrant labour became jobless and becomes zero income group. Government should take necessary steps to address these limitation while DBT (direct benefit transfer to PMJDY accounts).

Scope

This study has been done after COVID-19 lockdown, so analysis are done by taking only secondary data from government websites, and reports, and survey. No primary data are used in this study. This gives a immense scope to future researcher to use primary data and make generalization to get the exact figure of inclusion/exclusion of different rural and urban areas in India.

Conclusion

During disaster government policy should be for all not for certain groups, because during pandemic each and every individual of the country was impacted and face difficulties while collecting the essential need products for their livelihood. Still now after unlock no covid pandemic vaccine is tested yet. And this impact will continue for some time as per media report. So, if government will increase the relief cash amount from INR 500, and extend time duration from 3 months to at least for one year, then the economical condition of the poor people will definitely improve. Supply of Adhar based authentication payment machines can improve the transparency and optimal utilization of government relief fund.

Abbreviations

DBT: Direct Benefit Transfer;

PMJDY: Prime-minister *Jan-dhan-yojana*, (a Govt. of India scheme on financial inclusion).

Competing Interest Statement

All authors have read and approved the manuscript and take full responsibility for its contents. No potential conflict of interest was reported by the author(s).

Acknowledgements

The authors would like to thank the reviewers and editors of this manuscript.

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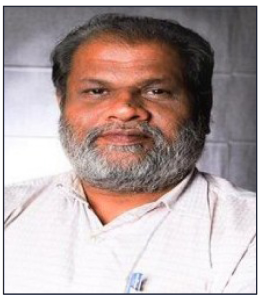

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Horizon J. Hum. & Soc. Sci. 2 (S): 59 – 66 (2020)

Journal of Humanities and Social Sciences Research
www.horizon-JHSSR.com

ORIGINAL ARTICLE

Impact of Internet Use during COVID Lockdown

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ARTICLE INFO

Article history
Received: 26-Jun-20
Revised: 25-Sep-20
Accepted: 29-Sep-20
Published: 15-Oct-20

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ABSTRACT

The Internet is an immensely useful network, which allows people to communicate information and share their feelings. It is playing a very vital role, particularly during the Corona Virus Infected Disease (COVID-19) pandemic, as the entire world runs with the help of this digital device. It enables the people of every country to operate within the four walls. Rooms are converted into classrooms, offices, meeting halls and others with the help of the internet. The COVID-19 has shattered the economic backbone of almost all the nations of the world. Thousands of people have already died and millions have suffered, immensely. Even in developed countries like, USA, UK, France, Italy, a large number of human lives have become prey to this virus. As a preventive measure, the Governments have declared frequent lockdown and shutdowns. As a result, the economic activities like, consumption, production, exchange and distribution of goods and services are hampered severely, which have made the economy slow down.

During this lockdown period, the internet acts as a blessing, as it connects everyone with the entire world by maintaining social distance and staying at home. With the help of Internet Communication Tools, people easily connect with each other and the rest of the world which encourage smooth operation of both personal and professional activities. Work from home, flexible scheduling of working hours, etc. progress the flow of tasks and responsibilities. Online meetings through video-conferencing, tele-conferencing and online chat etc. pave the way to run offices, institutions and other business concerns. At the same time, the internet helps people to come closer to those who are away from their homes, families, relatives and friends by maintaining social distance with digital closeness.

Present paper studies the degree, importance and impacts of consumption of the internet during COVID period.

Keywords: COVID-19, Lockdown, Economic crises, Emotional stability, Social wellbeing.

Introduction

The recently identified new Coronavirus is called as Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-COV-2), and COVID-19. According to the doctors the COVID-19 can be compared with common cold and pneumonia which affects the respiratory tracts and gut of birds, mammals and human beings. Its outbreak in Wuhan of Hubei state in China came to the notice of the World Health Organization (WHO) on 1st December 2019 and it was declared as a Global Public Health emergency on 30th January, 2020. This virus has already spread to

over 200 countries in the world and was recognized as "Global Pandemic" by WHO on 11th March, 2020. By 12th July, 2020 there were affected cases of 12,552,765 and death cases were 561,617 globally.[2] In India the death of people due to Coronavirus was 1,886 and the active positive were 37,916 and 16,539 patients were recovered as on 8th May, 2020. But by the end of August, 2020, it steadily increased to over 50,000 deaths and over 4 million positive cases. As the disease continued to spread all over the country, the Government of India declared a lockdown first on 25th March, 2020 for 21 days. Then, the Government extended the 2nd phase lockdown from 15th April, 2020 to 3rd May, 2020, the 3rd phase from 4th May, 2020 to 17th May, 2020 and the 4th from 18th May, 2020 to 31st May, 2020. This lockdown was declared to put restrictions on unnecessary movement of people outside their houses and not to congregate in worship places and cultural organizations etc. It was further extended again during June and July, after which unlock process started gradually. During the phases of lockdown and maintenance of social distance, internet has played immense role in the operation of different sectors like, IT, banking, insurance, educational institutions and many other organizations. The online services have made the day-to-day life easy and smooth during Global Pandemic.

Literature Review

According to Srivastava (2020), internet has played very crucial role during COVID period when the Government announced different phases of lockdown and people had to stay at home to maintain social isolation. Internet has moved forward the day-to-day lives of people in the sphere of IT, education and research, health, banking transactions, insurance, entertainment, shopping and other activities. Christenson (2020), has made study on how COVID-19 forced people to shift their habits towards online transactions which make the life normal. There are major changes in the consumption pattern of people as they prefer to online shopping and online spending with the help of internet. The e-commerce, online streaming and behaviour of social media heavily influence both industries and consumers. Madhukalya (2020), has studied on the increasing of online consumption during the Covid-19. It has increased to 13% from 9% in daily average consumption as people are locked in their homes and carried out both personal and official transactions by using social media. Udas (2020), states about the social distancing and the role of the internet which connects people and make them close to one another. Any form of outdoor is prohibited by the Government through lockdown to be protected from Coronavirus. So, people have spent more time on social media through different platforms like: Facebook, Netflix, Hotstar and Prime to share feelings and avoid the feelings of loneliness. The author also differentiates the physical world from the digital world which sometimes become the source of misinformation. According to Sengupta (2020), if the lockdown exists for more period then the people will be more acquainted with digital media. Remote education, work-from-home and entertainment are being transitioned to home with broadband connection or through mobile connection. The author also suggests better infrastructure which enables people for smooth operation of online activities. BIK team (2020), has stated about the better internet for kids, children and young people which empowers them. The safer internet assists the adolescents to be creative and innovative. When they are playing games, communicating with online friends, gaining and sharing information and knowledge etc. they should be protected from hackers and bullies. According to Obisakin (2020), the internet is the only source of transmission of information during Covid-19, pandemic. It makes interactions smooth and communications active without which the people feel lonely and stressful. During the lockdown and social distancing people are forced to maintain social isolation and stop the outdoor activities. The Internet has played a very vital role as it helps to public and private sectors, households, women, urban-rural and remote populations to run their activities by maintaining social distance. Choudhary (2020), has made study on impact of Covid-19 on educational sectors in India. The pandemic has disrupted the higher education sector as the universities and schools also have closed and 285 million young learners are affected. During this period internet acts as a blessing and e-learning comes as a definite solution to make the education system on. Both students and teachers are connected with each other and share knowledge from their own destinations. Luech (2020), has suggested that the internet is the source of work-from-home and people should be adaptive with this digital technology. Even they can operate it whenever and wherever it is needed. People can be easily connected and production and distribution of goods and services will be transparent with the help of the internet. According to the news published on 2nd May, 2020 by HT Correspondent, Hindustan Times, New Delhi internet plays a very vital role to connect the devotees with their religious places and to perform the holy rituals. They can participate in religious rituals by connecting online. The pilgrims and tourists also prefer digital worship who have started their journey for Char Dham Yatra. The "Golden Temple" in Punjab, "Baba Balak Nath Temple" in Himachal, and other temples in India are now using digital worship strategy for their devotees.

Internet Consumption during COVID-19

The novel Coronavirus popularly known as COVID-19, is an infectious disease which spread all over the world. To fight with this many state Governments announced to maintain "social distancing" and "staying at home" (Király et al., 2020). COVID-19 pandemic has changed the way of living pattern of people. Due to Lockdown, most of the people are more dependent on the internet because many people are working from home, students are attending online classes regularly, and teachers are taking virtual classes. The people also use Netflix, amazon prime videos and any other apps or websites for entertaining purpose. Many people turn to telemedicine and use more communication tools to communicate with others. This shows a significant increase of internet Data during this COVID-19 outbreak (Cohen, 2020). According to the Telecommunication Department, India consumes the internet data on an average of 307,963 TB (Terabyte) or 308 PB (Tera Byte) of data on a daily basis of the first week, or beginning of the lockdown period (Madhukalya, 2020). According to Openvoult's Broadband Insight Report showed the first quarter of the 2020, the average broadband consumption increased to 402.5GB from the 273.5GB during the last year 2019 that's around 47 percent. Due to lockdown the broadband usage increased to 233.6GB in the first quarter of 2020 from 190.7GB in the last quarter of 2019. Telecommunication department report also shows that the highest data 22.2 crore GB is consumed by the Jio users followed by Airtel 2.14 crore GB, whereas the Vodafone subscribers are used 1.60 Crore GB and BSNL users are exhausted with 63lakh GB. Speed test, a web page which that investigates the internet access performance over the globe, its latest report tracking Impact of COVID-19 on speed around the world which was updated in April 15, demonstrated a 4 percent increase in fixed line speed and 8 percent in portable device's speed when we contrasted with the seven days stretch of March 2. According to this report, India's present data consumption speed is normal of 36.17 Mbps and portable device speed is 9.67 Mbps (Ookla, 2020). According to Open vault report (Q12020), average consumption jumps to the 402.5 GB at the end of the 1st quarter of 2020, which has increased of 47% from the 1st quarter of 2019, the average data was 273.5GB and 17 percent rise over the 344.0 GB in 4thQ2019. The rate of increase in median growth has also accelerated to 122 in the first quarter 2020. According to COAI (Cellular operators association of India), the average rate of data consumption on a quarterly basis was 6900 Petabyte (PB) in the year 2019. But this pandemic drastically changed the consumption pattern of the internet, said Director General Rajan S Mathews from COAI. It was estimated that there is a hike around 20% after covid-19 outbreak in monthly data consumption, which is around 8980 petabyte (PB). Excitel claims that 3 lakh customers from India recorded an average data consumption of 15.56 GB per day. With this additional data the average data usage per month was 400 GB in the month of March 2020. According to Excitel Broadband, the average data consumption for the 3rd week in the month of March was 16.8GB per day. But it increased in the month of April to 17.6GB per day during this outbreak.

Internet Service providers (ISP) in India during this COVID-19 Lockdown

During this pandemic, almost all the ISPs in India are trying their best possible way to provide unlimited internet service to their customers and companies. It is also challenging for those as there is heavy competition. In India, ISP (Internet Service Provider) provides broadband speed which is growing during this time. According to the Testmy.Net demonstrated that ACT (Atria Convergence Technologies) provides the highest download and upload speed as compared to other networks. The following table shows the speed of download and upload file by different networks:

Company	Download Speed (In Mbps)	Upload Speed (In Mbps)
ACT	40	36
Tata sky broadband	34	35
Airtel	25	13
Excitel	18	29
Tikona	18	3
Hathway	17	12
You Broadband	17	6
MTNL	10	5
JIO	9	3
Bsnl	8	5
Vodafone	5	4

Source: https://inc42.com/features/as-coronavirus-quarantines-test-networks-isps-keep-india-online-24x7/ (Naik, 2020)

Data Consumption by Different applications during this Outbreak

People are stuck at home during this outbreak situation, movie theatres are closed, no restaurant to dine in, offices and other business concerns are closed. So many people are engaged with work-from-home, various entertainment apps, food apps, shopping apps from their correspondent place respectively. These habits

significantly increase the consumption pattern of internet use (Koeze, & Popper, 2020). With this respective, Infinera is a telecommunications network, who has an instructive infographic that clarifies about the online propensities that have expanded our aggregate information use. According to its observations, 50,000 years' worth of media was gushed in only one day, on 4th April, 2020. There is also expansion of spilling administrations Netflix and Peloton users rose 22 percent and 66 percent, individually, year over year. Disney+ is likewise four years in front of its client projections, with 54 million paid supporters as of now. Use of social media also has risen continuously during this pandemic, leading a 27 percent expansion in Facebook traffic and a 26 percent growth in quarterly meetings on LinkedIn. TikTok has seen a 25 percent rise in monthly downloads, and informing applications, for example, WhatsApp are handling twice the same number of video and voice calls. Social video applications have additionally observed a flood in fame, with Bunch getting 1 million downloads in only seven days and House-party seeing a 70 percent expansion in month to month information exchanges. According to Sensor Tower Report, for the first time the data consumption has increased because of the installation of 250 mobile apps from the Google play store or app store. As per the report, 596 million gigabyte or 596 Petabyte of data is used for nearly 56 million hours for 4k streaming content during this COVID-19 lockdown. This report also states that there were 33.6 billion new apps installed from the play store and app store during the 1Q 2020. According to TechCrunch report, during this Covid-19 outbreak, Whats app has increased 40% its usages whereas Facebook usages has increased 37% (Parez, 2020). Kantar, organised a global survey to understand the customer's attitude and social media use and expectations during this outbreak. This survey was conducted by 25,000 consumers across the 30 markets during the 14th-24th in the month of March. Survey result shows that Whats app use has been increased 40% from the earlier data consumption 27%. Because of heavy dependence on internet use and quick speed, gigabit internet subscribers expanded by 97%. This percentage was 1.9% from the starting year of 2019 and it was increased 2.8% by the end of the year 2019. It was increased 3.75% at the 1Q of 2020. According to Digital Information World. In business application Microsoft Team has established a precedent of 2.7 billion total meeting minutes in a single day. Slack has been 80% hike in new paid customers in the 1Q 2020. In gaming applications, Nintendo has seen 41% a flood in the yearly benefits, while for social gaming applications, Bunch lives 1 million growth of users in a one week. There were 70% users sign-in social gaming applications like: Pubg, fortnite etc. Microsoft also has increased 775 percent in its cloud service use for the work purpose, particularly, in the areas where lockdown and social distancing were strictly implemented. In the 1Q of 2020 Amazon Web service has 70% of growth in revenue generation. Digital Consumption during this COVID-19 outbreak has been seen as a beneficiary for the entire world. This Digital Media consumption provides opportunities to build a faster and more refined profile of users.

Different Categories of Users

The whole world is now totally dependent on the Internet.COVID-19 lockdown has forced every individual to complete their assigned work from home. But, In India there is a digital divide in terms of digital literacy which is the most vulnerable section of our society. According to Pew Research Centre, 57% use the internet from the 18-29 age group, whereas 35% people are from the 30-49 group and only 18% people are above the 50 age group. Survey results also show that lower educational people use less internet than educational people. Particularly in India, 69% of educated people use the internet whereas 23% uneducated people use the internet. This survey also resulted in 49% people using social media between the age group of 18-29, whereas 29% are from the 30-49 age group and 11% are from the above 50 age group (Schumacher, & Kent,2020). During the COVID-19 many people use internet for entertainment, shopping and chatting etc. because of leisure time and free time. This Pandemic has forced the people to stay at home in past few weeks and it is very difficult for the kids, school going, young generation and senior citizens. The education of kids and adults is converted into e-learning where they are engaged for a little period of time and they are engaged in online playing, home makers use internet for shopping and gossiping, seniors for banking, health purpose and a large portion of young mass spend more time on entertainment purpose (Goyal, 2020).

Internet Consumption during COVID-19 in Odisha state of India

According to NSS (National Sample Survey organization of India), Odisha is at the lower position among all states regarding computers and the internet use. The report demonstrated that the household having a computer facility 6.4% less than the national average 10.7% and the household having internet facility 13.8% less than the national average of 23.8%. But During this COVID-19 Lockdown, the Odisha Government has provided service over online. If any Individual wants to travel for medical

reasons or for any important activities then he/she will take permission from the collector, DCP, Police commissioner. The Odisha is the first state to prepare a blueprint for the migrant workers and it has additionally reported new online rules for **e-Passes** while facilitating the travel limitations in Covid-19 green and orange zones. For applying, Odisha Government has two different websites to log in.

1. For COVID-19 ePasses in Odisha, people can visit http://covid19.odisha.gov.in

2. Migrant Workers can visit https://covid19regd.odisha.gov.in/migrant-registration.aspx for ePasses which is provided by the Government of Odisha.

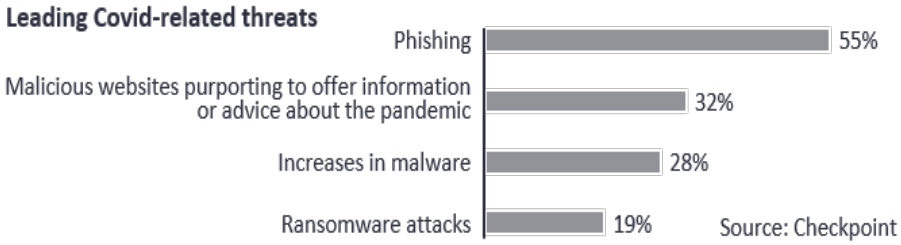
Not only e-passing but also Odisha Government provides telemedicine to fight against coronavirus. Subsequently it has prepared seven exceptional COVID-19 emergency clinics in various districts of Odisha. The state Government has chosen to dispatch COVID-19 telemedicine helpline 14410 to give clinical help to individuals showing coronavirus symptoms. They can register themselves (www.bit.ly//IndiaTeleMed,) in this website. Due to this COVID-19 outbreak, AIIMS Hospital located in Bhubaneswar (Odisha) has launched to provide telemedicine to their patients. As per the report, patients can provide their signed prescription and e-prescriptions through WhatsApp to their respective service providers. Here we specially attached the contact numbers with their respective departments.

Source: https://aiimsbhubaneswar.nic.in/covid.aspx20-07-2020

Threats of Excess use of internet during COVID-19 Lockdown

COVID-19 lockdown and social distancing are the major precautions to reduce the spread of coronavirus. Hence, it promotes staying at home and self-isolation, but in some instances it is also forced to stay in quarantine. The fearness of this corona virus and also the consequences of lockdown increases the stress, anxiety and mental illness which affect the individual, families and society as a whole (Ahorsu et. al., 2020). To avoid these problems, peoples are engaging themselves in Internet, which may give them some relaxation, but the excessive internet use may increase their psycho-active substance. Other fortifying practices like betting, video gaming, T.V series watching and enjoying their lives in different social media, watching pornography, continuously using interne or virtual life may decrease their pressure and uneasiness and additionally mitigate discouraged temperament. These continuous addictive behaviours help to overcome such psychological illness or escape themselves from the issues and negative thoughts, which people are suffering during this COVID-19 lockdown (Blasi et. al., 2019). Thus, the continuous use of such practices and taking part in the previously mentioned practices as a putative to cope with this crisis, like COVID-19 outbreak, increase significantly and may it develop into a practice which will be difficult to handle or hard to break it (King, Delfabbro, Billieux, & Potenza, 2020). ICT and the Internet became a “rescuer” during this pandemic. Because it contributes indispensable dispersing information about the outbreak situation to the world wide and in some it is never possible without ICT (Király et. al., 2020). But on the other hand, the excessive utilization of internet carries a risk factor, while thought about the health condition. Because excessive involvement in a specific online activities such as gambling, watching pornography, addicted with games (For instance, nowadays especially youngsters are addicted with Pubg game), video game, social media, watching web series may lead to serious issues, which may cause to rise the threats or the addictive use and increase the cyber-chondria disease (Vismara, et. al., 2020). Overuse of internet develops the anxiety and excitement for more use of the respective field because respective industries (e.g. - gambling, video game, watching web series and pornography video) may motivate their respective customers to spend more time with these activities (Rumpf et. al., 2018).

Excessive internet increases the security threats or attacks during this COVID-19 pandemic because many people are working from home, so IT and security are facing different challenges in providing and securing mass connectivity. According to Checkpoint, Security professionals have noticed that 71% increase the security threats and attacks from the beginning of the COVID-19. The main danger cited was phishing 55% followed by malicious websites who claimed to offer the information during this outbreak is 32% and 28% increase in malware and ransom ware assault 19% which was noticed during



Source: https://iot-analytics.com/the-impact-of-covid-19-on-the-internet-of-things-part-2/20-07-2020 (Luith, 2020)

this COVID-19 lockdown. Indian Computer Emergency Response Team (CERT-In) also announced the increase of phishing attacks during this COVID-19 lockdown because of excess use of the internet.

Suggest strategies to curve the threats

During this COVID-19 outbreak, it is very important to control the above behaviours and problems facing every individual. The multidisciplinary and group of experts provides some practical recommendations which may help to decrease the risk of excess utilisation of the internet.

- Use analogue technical watch
  Analogue technical watch is very much popular in digital generation as it consists of specific format of time and sources of digital power. At the same time, it is more precise and reliable in creation of "ticking" motion and smooth movement of seconds, minutes and hours. It is helpful for the user to make self-restrictions on use of the internet and as the time changes, the hands move around the face which makes analogue watches different from digital watches (Arslan, 2020).

- Keep contacts with friends, family and relatives
  Spending enough time with Facebook, chat room friends, game zones etc. take away the user from the family members and relatives. The user uses virtual association of friends and play rooms which invites internet addiction in the young mass. To overcome addiction the user should temporarily block certain websites and develop better habits of spending time with family, friends and relatives actually rather than virtually. Wasting time by remaining online for hours and hours it is advisable to spend time with nearer and dearer with the social set-up (Boeddeker, 2019).

- Consult health professionals
  The internet addiction disorder is also known as Compulsive Internet Use (CIU) or Problematic Internet Use (CIU) or iDisorder which hampers both psychological and physical status of health of the victim. The victim must have gone through the therapy prescribed by the health professors. Both medication and meditation are advisable to reduce anxiety and depression faced by the heavy user of the internet. The addiction may resolve with Cognitive behavioural Therapy (CBT) and minimum or limited use of internet or only use for productive purposes (Gregory, 2019).

- Focus on goal oriented life with self-concentration
  It is always advisable to focus on own goals and impose restrictions by self while using internet. Preparation of whitelist or blacklist on certain sites will help the user to keep concentration on needed aspects rather than blocking the entire internet. The goal oriented aspects like: writing, social media management and event planning etc. help the user to remain away from Facebook or Twitter etc. To avoid excess use of internet or to be addicted by it, just focus on self-awareness and task oriented aspects on a single time. Being aware of self-observing and managing one's screen time. Individuals need to control themselves by observing the spending time on the internet. Block yourself from the websites and put the phone somewhere, where it can't be easily accessed. The time out reminder is also helpful for the user to take a break to keep the focus sharp (Glei, 2010).

- Proper Utilisation of digital apps.
  It is very important for the user to use specific apps which have usefulness rather than utility. Internet should be used for meaningful purposes like: to be connected with family members and peers, completion of assigned tasks, update with world activities etc. rather than making friendship with unknown people and gossip with strangers. To be protected from hackers and bullies the user should concentrate on specific apps which are developed to control time and used for productive purposes. At the same time, the user should record the time which is spent on apps (WikiHow, 2019).

Conclusion

The COVID-19 has turned out to be the most disastrous crisis of the century, for the entire world. Present preventive of social distancing, which every Government has applied, is the main option today. But economy and also general public have suffered heavily. There is already signs of recession and heavy slowdown of the economy. Because of loss of job, unemployment problem and lack of income, there is reported increase in personal stress, anxiety and domestic violence. The call of the day is to accept the 'new-normal' of doing all possible activities on digital platform. To revive the economy Government has to come out with a big spending plan, and also strengthen and extend the ICT infrastructure. Government intervention would play a very vital role during this crisis period of people. During this period, internet acts as a blessing to human being and the overall world. Almost all the activities related to consumption, production, exchange and distribution are being done on digital platforms. The apps related to entertainment, shopping, teaching, banking, game, health, fashion, beauty, yoga etc. are very helpful for the people, making the life bit normal. They spend their time happily and fight social isolation during Corona pandemic lockdowns. But excess use, or the abuse has its negative impact, too.

Competing Interest Statement

All authors have read and approved the manuscript and take full responsibility for its contents. No potential conflict of interest was reported by the author(s).

Acknowledgements

The authors would like to thank the reviewers and editors of this manuscript. Authors also acknowledge receipt of financial support from ICSSR – IMPRESS fund of Govt. of India.

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Horizon J. Hum. & Soc. Sci. 2 (S): 67 – 74 (2020)

Journal of Humanities and Social Sciences Research
www.horizon-JHSSR.com

ORIGINAL ARTICLE

Work from Home: the Modus Operandi during COVID-19

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ARTICLE INFO

Article history
Received: 26-Jun-20
Revised: 25-Sep-20
Accepted: 29-Sep-20
Published: 15-Oct-20

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ABSTRACT

As whole world has been hit by the COVID-19 pandemic companies are slowly trying to get back on track. India went to 21 days of complete lockdown disrupting lives of billions of people. Gone are the days when people used to get up and rush to their office. As Govt. has prioritized social distancing norms and asked people to stay at home to curb the virus infections, company have asked their employees to work from home. It has become an essential mode of survival for both employee and employer. This pandemic isn't going to end very soon as per researcher so work from home seems to be carried on for a long time. With the number of COVID-19 positive cases hitting almost 12000 per day and India being currently 4th worst hit country by the pandemic situation looks too grim at present. This paper focuses on evolution of work from home, its effect on productivity. It also tries to make out a brief comparison about how the work from home mode has grown during the pandemic. This paper also throws some light on the benefits and challenges during work from home and finally future implications. The researcher has also thrown some lights on the current scenario of work from home in India and also the impact of COVID-19 on the IT sector.

Keywords: Work-from-home, Evolution, Covid-19, IT sector, productivity.

Introduction

Life had come to a standstill in India when Prime Minister Shri Narendra Modi declared complete shut-down on 24th March 2020 for complete 21 days. This was done to break the COVID 19 cycle from spreading rapidly. The pandemic already had such disastrous effect on other countries like US, Russia, China the government of India had to go for a complete lockdown because of such a huge population. Companies across India and abroad went for Work from home mode following the Stay Home, Stay Safe principle. With government now easing the norms still most of the companies are preferring to continue the WFH mode for their employees with their safety the utmost concern. With the number of positive cases of COVID 19 almost touching 15000 per day WFH seems to be the new normal. Even after the initial restrictions imposed the number of cases are seeing a increasing trend since the government has given some relaxations. Work from Home has grown rapidly during the pandemic outbreak and is helping for the smooth operations of the companies. It may not be possible for every sector to implement this mode but still maximum sectors are implementing this to curb the spread of the pandemic.

Methodology

The research paper study has been based on secondary data that has been collected from various websites, newspapers and research article.

Evolution of Work From Home(WFH)

There was a time when work from home(WFH) wasn't a possibility as technology didn't exist. If one's colleague or business partner wanted to get in touch with one when someone was out of office than they couldn't email, text or direct message. One would have to provide a alternate phone number, a pager or even a fax number for any work related conversation. As per Samantha Lambert, director of human resources at website design company Blue Fountain Media work from home meant a telemarketing or customer service position at minimum age ten years ago. It was rarely considered as a full time career. But now with the advancement of technology the same job can be done no matter wherever we are. It has enabled to be with contact with the workers or client any time. One of the most helpful technologies for seamless WFH is video conferencing. Live video feeds help workers with interact with each other in real-time anywhere with just a help of internet connection which is next best thing to face to face interviews. This could only be possible because of widespread broadband adoption in the last 10-15 years. With the advancement of technology many companies have done away with traditional offices and run their business out of co-working spaces to encourage people to WFH. In a severe pandemic like COVID 19 with more and more employees WFH they would not only protect public health but also contribute towards continued success of the business.

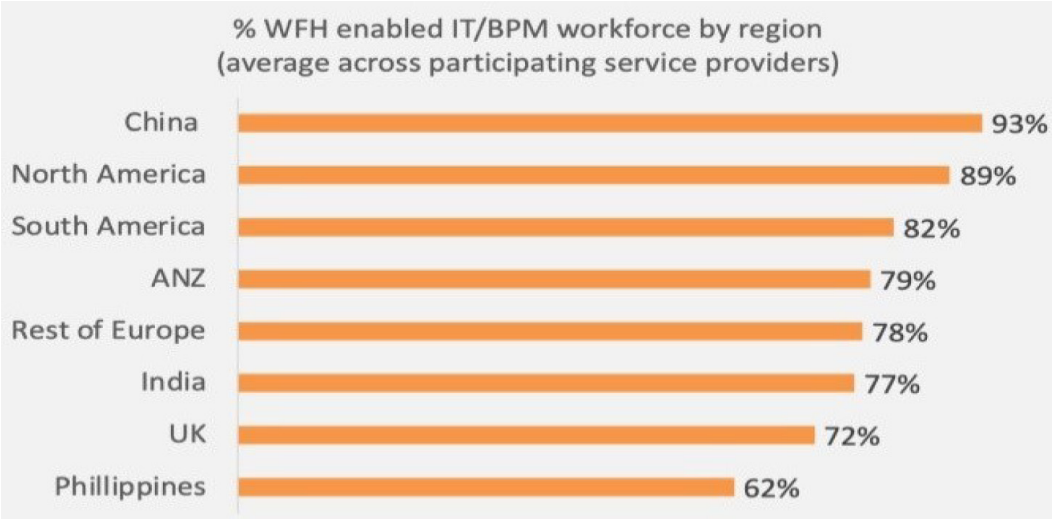
Current Scenario of WFH in India

Even as the restrictions for the COVID-19 lockdown are gradually easing, organizations are framing long term policies to enable most of employees to WFH. Marico is working with a external consultant to bring about a critical shift in the way the company was traditionally operated. They are planning to put at least 40% of its office based staff to WFH. Advertising firm Wunderman Thompson is looking for a 50:50 solution so that not more than half of its staff on any given day are at office. Mercedez-Benz India is looking to mandate only three working days in office each week and two days of WFH. At KPMG India, 33% of the staff will have access to office in Phase 1 on a rotational basis. During the lockdown Indian IT industry made employee WFH as per government's mandate. As a result 90% people worked from home out of which 65% of them worked from homes in metros and 35% from homes in small towns. Amazon India has extended its WFH for employees till October 2020 whereas its rival flipkart will start its proceedings on a rotational basis.

Though countries across the globe are fighting the COVID 19 pandemic, technology companies are ensuring that there is no lockdown in work. They have asked their employees for remote work to run their businesses among all uncertainties. This was the survey done by HFS research during the month of April 2020.It can be seen global IT-BPM industry did a remarkable shift in the way they were operating by enabling over 75% of employees to work from home within weeks. We can see from the data china was leading with 93% employees whereas Philippines lagged behind with only 62%.

WFH effect on productivity

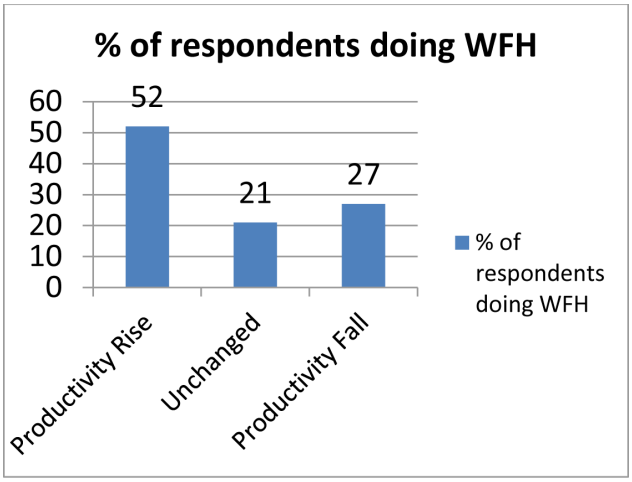
As per the survey done by Airtasker in US which consisted of 1004 full time employees, 505 were remote employees

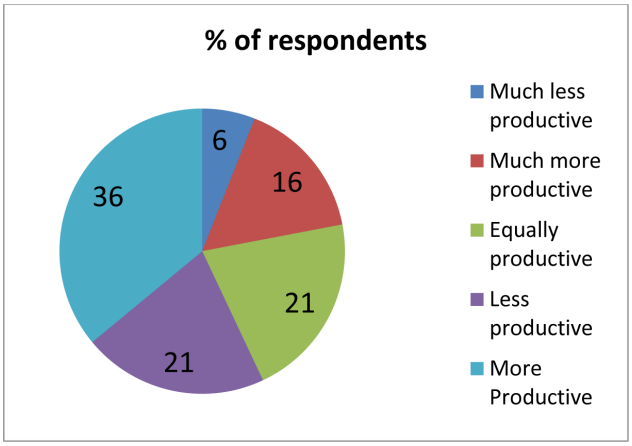


Source: HFS Research

the results indicated that remote workers were actually more productive than their office counterparts. The study found that remote employees worked an additional 1.4 more days per month than office goers which is approximately 17 workdays a year. It was also found that remote employees take longer break than employees which is 22 minutes as compared to 18 minutes by office goers. However they work additional 10 minutes a day. The study also suggested that office goers are unproductive for an average 37 minutes a day whereas it is 27 minutes in case of remote employees. Moreover 15% remote employees claimed there boss distracted them at work which was 7% less as compared to office goers. While this statistics may encourage both employee & employers to implement a work from home program, some remote employees also reported higher levels of stress and more difficulty in finding work life balance as compared to office goers. According to American Psychological Association remote work can increase employee satisfaction if implemented correctly.

However according to a study done by research based innovative venture SCIKEY Mindmatch about 99.8% of workforce in IT sector is incapable of working from home and only 0.2% are WFH champions and showcase high productive attributes. It further indicated 99.8% of the workforce lacked at least one of the qualities, including resistance to learning and exploring (95%), practical communication skills (65%), planning and execution (71%). Therefore it still remains a debatable topic whether WFH increases productivity as it may vary across industries and countries.

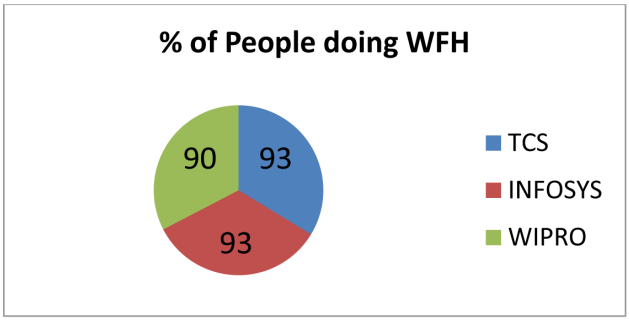




Source: Simplilearn- A digital Skills training platform

Impact of Covid-19 on IT sector

Hardly did anyone know that India's 4 million IT sector would shift to working from home overnight after the COVID-19 pandemic hit the country. As per Ramkumar Ramamoorthy, chairman & MD of cognizant India the company set up a core committee that worked across multiple work streams to ensure delivery and service continuity, while safeguarding public health and wealth being. The lockdown which was effective from March 24 to curb the spread of the pandemic meant 90% of two lakh cognizant employees could not work from campuses in India and as it spread globally same was the case in Europe and US. Indian IT industry had to move desktops that employees were using at workplaces to their homes as they couldn't procure laptops in huge numbers at such short span of time. It was not just cognizant, its rival TCS also made the shift along with software companies like Infosys, HCL technologies, Wipro and Tech Mahindra. These companies together employ over 1.2 million people which contribute almost half of India's software exports. TCS said it had built a infrastructure model that could shift nearly 4.5 lakhs employees to work remotely. As per N Ganapathy Subramanium, chief operating officer at TCS close to 90% of employees are working remotely and the company shifted 40000 desktops to employees to work from home. Infosys provided high speed broadband connectivity for remote workers and expanded by ten times its own virtual private network bandwidth. It also shipped 35,000 computers to employee residences



Source: Nasscom data

and made sure that there was four times increase in backend capacity to support the increase in concurrently connected remote users.

Benefits of Work from Home

For Employees

i. It's more productive compared to work from office

Productivity studies have revealed that working from home has helped employees to get more out of their workday. A study done by Stanford showed that people doing WFH were 13% more productive than their traditional office colleagues. Moreover people doing WFH took less sick leave and they can organize their work to fit their most productive times and produce good quality work.

ii. Workers save more money compared to office workers

A study done by Global workforce Analytics found that people doing WFM can save $2000-$7000 every year. Workers can save on commuting, clothing, food, child care etc.

iii. Less Stress and better work life balance

It is one of the flexibility provided by WFM. People have less stressful life and a better work life balance. According to a study done by Owl Labs, many workers reported alleviated stress levels wit even one day of work outside office. 86% of the respondents in the survey reported WFM not only reduces stress levels but also improves their health.

iv. Flexible work schedule

In a survey done by Buffer it was found that 40% of respondents considered flexibility as one of the biggest perks. The ability to work during ones productive hours and to choose days to work in a week allowed people to spend time with their families.

v. Better job opportunities for professional

As people would save time in travelling and spending time in office they can spend those valuable time in developing their careers and looking for better job opportunities.

For Companies

i. Higher Employee loyalty & Retention Rate

As per the survey done by owl labs, people doing WFH said they were likely to stay in their current job for the next 5 years,13% more than onsite workers. Moreover 55% respondents said they would likely look for another job if they were disallowed the same method of working.

ii. Cost saving

Not only employee save by WFH employers too get lots of benefits. The benefits could be in form of office rent, furniture, monthly utility bills which could help in increasing the profit.

iii. A broader pool of professionals to choose from

With WFH being the modus operandi employers would no longer be limited to hire local people as they can recruit people from anywhere as people won't be required to attend office.

iv. Improved Employee Morale

The flexibility in working conditions will motivate employees to be more productive at the workplace. High employee morale leads to less turnover, greater enthusiasm to work and high job satisfaction.

For the environment

Reduction of greenhouse gas emissions

As people won't be required to travel to office during WFH there will be reduction in millions of oil barrels required for the transportation vehicles. We have already got the evidence how the pollution level reduced drastically when India was under complete lockdown to control the COVID 19 pandemic.

Challenges facing Work from home

i. Unplugging from work

People working from home tend to be workaholics, especially when the deadlines are strict and there's a heavy workload. Since most of the work is done from home

people tend to find it difficult to switch from work atmosphere to enjoy available free time.

ii. Loneliness

Work from home method also separates workers from co-workers as they don't get face to face interactions which are only limited to online meetings and collaborative online workplaces. So they tend to feel isolated. It may not be the case with married people or people having more friends outside.

iii. Distractions

While working from home people may have to do many things simultaneously which may distract themselves. In the office it is not the case as they are constantly monitored and certain set of guidelines are followed by all co workers.

iv. Collaboration and communication

It can be highly challenging for people working from home to collaborate with co workers and communicating ideas to other team members. They have to be highly reliant on written and asynchronous communication using project management systems.

Conclusion & Future Implications

Despite the government lifting lockdown restrictions most IT and technology companies are in India are in no hurry to get back to office. Since most of their work happens over the internet and since there are more powerful online collaboration tools work from home has had no adverse impact on productivity. Most are planning for staggering returns over several months. Some are looking at rotating teams that come into office and many are leaving it upto employees to decide whether they feel comfortable enough to return.

Goldman Sachs, which has a 5500 people strong technology and service centre in Bengaluru expects only about 30% of its staff working from its office over the next few months which will also be done in staggered manner. Global software consultancy Thought Works is looking at a new normal where only 40-50% of employees will work from office, on a rotational basis. Employee will be allowed for work from home option as long as needed. Google and Facebook in India indicated they would be following their global guidelines. As per Google CEO Sundar Pichai, the company is planning to have an employee come in one day every couple of weeks, which would mean about 10% building occupancy at any point. Around September it will scale the rotation programme to 30% of building capacity. As per the Facebook CEO Mark Zuckerberg employees can choose from work from home in 2020 if they can do their jobs productively. It is planning to open offices with 25% of capacity initially. So it can be seen that health and safety of employees have been given utmost priority by all organizations and they are not willing to compromise on it. Moreover it might not be possible for every industry to adopt the WFM approach and it may vary across industries.

Competing Interest Statement

All authors have read and approved the manuscript and take full responsibility for its contents. No potential conflict of interest was reported by the author(s).

Acknowledgements

The author(s) would like to thank the reviewers and editors of this manuscript.

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Horizon J. Hum. & Soc. Sci. 2 (S): 75 – 82 (2020)

Journal of Humanities and Social Sciences Research
www.horizon-JHSSR.com

ORIGINAL ARTICLE

Covid-19 Pandemic: Past, Present and Future Perspective of Indian Economy

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ARTICLE INFO

Article history
Received: 26-Jun-20
Revised: 25-Sep-20
Accepted: 29-Sep-20
Published: 15-Oct-20

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ABSTRACT

"Don't react, but respond"

The world is struggling with modern horrors such as COVID-19, which has left the planet confused and brought the whole universe to a halt. This deadly virus, which is declared as pandemic by the World Health Organization (WHO), has taken in its grip nearly 210 countries. As our new Calendar year begins, the Novel Coronavirus (COVID-19) has infected more than 14.3 million people in more than 210 nations and territories, resulting in 6,02,000 deaths-impacting lifestyles, businesses, economies, and the assumption of common well-being that many of us have taken for granted. Though countries and businesses are struggling to understand the scope of this pandemic, there is no surprise that we are experiencing a deliberate change in living standards of the people.

The main aim of this paper is to figure out how the business today might turn towards which side of the globe. Taking advantages of these would probably help to navigate the economically and socially viable route to the better normal.

- Transition to Localisation
- Digital gains a significant push
- E-Learning platform
- Work from Home mechanism
- Switch to variable cost models
- Develop resources for sensing and managing towers
- Resilience in supply chain is vital

The crisis in short, is a story with unpredictable ending. However, what is clear is COVID-19 has established new challenges to the business environment which call for a measured, practical and informal approach from political and business tycoons. There is presently a little clarity as to how long the pandemic will last, and what its effect on the economy will be in the near future. The industries will certainly be impacted by this "black swan" event.

Keywords: COVID-19, Localisation, Digital gains & Supply Chain.

Introduction

This year's global economy has been the worst hit since the great depression, says International Monetary Fund (IMF). Just before this pandemic began, the global economy faced instability due to trade disturbances and reduced growth. The situation has now been made worse by the shocks in demand, supply and liquidity caused by COVID-19. The shape and speed of recovery in the G20 nations will be the key factors determining the nature and sustainability of world economic, once the pandemic is stabilized whole over the planet. We expect the path of economic recovery in India at this time to be easier and faster than that of many other developed countries. In fact, there has also been a sensible discussion among economic and political thinkers about the upcoming challenges for India after lockdown is over along with the suggestive policy initiatives to curve the situation. While our political leaders, economist and government, are now focusing on securing the population from health risks and providing support, especially for the poor section of people. We do need to think from long-term perspective to secure economic health, business profitability and livelihoods of people.

Background of the study

The globe has undergone a variety of epidemics, including the Spanish Flu of 1918, HIV / AIDS outbreak, SARS[1] (Severe Acute Respiratory Syndrome), MERS[2] (Middle East Respiratory Syndrome) and Ebola. India also fought with diseases like the small pox, plague and polio in the past. These have all been fairly serious episodes individually. COVID-19 's growing prominence has turned the world's hustle into different degree of uncertainty. This virus also raises a very serious threat to the global economy, which is already in danger. One of the few dimensions that appear relatively clear is that the present slowdown varies significantly from the recessions we've experienced previously. This is another turn of the business and economic cycle but a shake-up to the international economy.

Indeed, UNCTAD[3] has predicted that China and India would be the major economies least vulnerable to recession in its latest research "The COVID-19 shock to developing countries". Many famous economist and policy makers like Raghuram Rajan, former RBI governor and Prof. Abhijeet Banerjee, Nobel Laureate acknowledges that India is moving towards to encounter great socio-economic emergency since independence.[4]

However, the Covid-19 which evolved in China in December 2019 and spread rapidly to almost every parts of the world over the next few months, may potentially turn out to be the biggest health crisis in the history of universe. Many experts have already described this as a Black Swan event for the global economy.

Literature Review

Ahani and Nilashi (2020) jointly made a study on *Coronavirus Outbreak and its Impacts on Global Economy: The Role of Social Network Sites* highlighting the effect of the Coronavirus outbreak on the global economy and the role of social network sites in exchanging knowledge and concerns about the Coronavirus outbreak with consumers and businesses. The paper ends with several descriptions of the problems of travellers as well as their input on social networking sites and ideas for future research.

Fornaro and Wolf (2020) jointly made a study on *Covid-19 Coronavirus and Macroeconomic Policy* provides a simple design for understanding some of the macroeconomic effects of the coronavirus epidemic. They focused on a situation where the Covid-19 outbreak triggers a persistent disruption of supply, probably continuing till the end of the epidemic. Aggressive investment support policies will break the supply-demand doom loop and push the economy out of the traps of stagnation.

Sohrabi, C., et al (2020) made a study on *World Health Organization declares global emergency: A review of the 2019 novel coronavirus (COVID-19)*. Authors analysed about the precise mechanisms of human-to-human and animal-to-human transmission to promote the development of a virus specific vaccine. However, a major limitation to the current review is the rapidly evolving nature of the Covid-19 epidemic. As a community, it is our responsibility to be aware of the aforementioned signs, symptoms and to promote escalate suspected cases.

Fernandes (2020) made a study on *Economic Effects of Coronavirus Outbreak (COVID-19) on the World Economy*. Author discussed the economic impact of the COVID-19

[1] *SARS: A infectious respiratory illness caused by a coronavirus, and often fatal*

[2] *MERS: Middle East respiratory syndrome related coronavirus, or EMC/2012, is a species of coronavirus which infects humans, bats, and camels.*

[3] *For more details kindly go through the link-* https://unctad.org/en/PublicationsLibrary/gds_tdr2019_covid2_en.pdf

[4] https://indianexpress.com/article/opinion/coronavirus-india-lockdown-economy-amartya-sen-raghuram-rajan-abhijit-banerjee-6364521/

crisis across the whole nations. It also provides estimates of the potential global economic costs of COVID-19, and various countries' GDP's growth rate. The author could see a median decline in GDP in 2020 of (2.8%) in the sample of 30 countries covered. In other cases, GDP will decline by more than 10%, in some countries by more than 15%.

Chohan (2020) made a study *on A Post-Coronavirus World: 7 Points of Discussion for a New Political Economy*. Author depicts about the post-coronavirus economy and policies, which can be designed and structured on the basis of lessons learned from the outbreak, as well as international reactions to the hardships that followed. He also raises seven points of discussion for international policymakers as the outbreak subsides, with the aim of generating debate for the public about greater post-corona value creation.

Objectives of the study

- To examine the impact of Covid-19 based on Economic Indicators of various world economy.
- To measure the impact of selected independent variables on GDP growth rate before and after the onset of Covid-19.
- To figure out the changing contours of post Covid-19 economy in G-20 nations.
- To present few future directions of new paradigm of corporate world and living standards across G-20 nations.

Research Hypothesis

H_{01}*:* There is no significant change inGDP Growth rate between pre and post incidence of Covid-19 for G20 nations.

H_{02}*:* There is no significant change in Inflation rate between pre and post incidence of Covid-19 for G20 nations.

H_{03}*:* There is no significant change in Unemployment ratebetween pre and post incidence of Covid-19 for G20 nations.

H_{04}*:* There is no significant change in Consumer Price Index between pre and post incidence of Covid-19 for G20 nations.

H_{05}*:* There is no significant change in Industrial Production between pre and post incidence of Covid-19 for G20 nations.

H_{06}*:* There is no significant change in Interest rate between pre and post incidence of Covid-19 for G20 nations.

Methodology

The study is based on secondary data collected from sources like IMF & RBI websites, Trading economics, magazines, journals etc. Total of G20 Country's world wide has been taken for data collection. In this study, paired T-Test has been used for testing hypothesis to find out the dependability of Covid-19 based on various economic indicators of the world economy. Stepwise Regression method has been used to measure the impact of selected independent variables on GDP growth rate before and after the onset of Covid-19.

Data Analysis and Results

For testing the hypothesis, paired *t*-test has been used to find out the solution for it and degree of freedom *(d.f.)* = (n-1) = (20-1) = 19. After putting the data in Statistical Package for the Social Science (SPSS), we got the calculated value mentioned above in the table.

Since, in three cases i.e. Unemployment rate, Consumer Price Index and Industrial Production the calculated value is greater than the tabulated valueat 5% level of significance i.e. 1.729, it is significant and the null hypothesis is rejected. In rest three cases i.e. GDP Growth, Inflation and Interest rate the calculated value is smaller than the tabulated valueat 5% level of significance i.e. 1.729, it is Insignificant and the null hypothesis is accepted.

The study conclude that the impact of Covid-19 has been affected to the world economy with respect to Unemployment rate, Consumer Price Index and Industrial Production.

Stepwise Regression Analysis

To measure the impact of selected independent variables on GDP growth rate before and after the onset of Covid-19, Stepwise Regression method has been used to find out the solution for it. After putting the data in E-Views 11, we got the value mentioned below in the table.

1. Dependent Variable: GDP_Q4_20
   Method: Stepwise Regression
   Included observations: 20
   Number of always included regressors: 6
   Selection method: Stepwise forwards

Table 1: List of G20 Countries

	GDP Growth Rate		Inflation Rate		Unemployment Rate		Consumer Price Index		Industrial Production		Interest Rate	
G20 Country List	**Q4/20**	**Q1/21**	**Q4/20**	**Q1/21**	**Q4/20**	**Q1/21**	**Q4/20**	**Q1/21**	**Q4/20**	**Q1/21**	**Q4/20**	**Q1/21**
Argentina	−0.5	0.6	40	38	11.5	11.7	397	408	1.5	1.6	32	32
Australia	0.6	0.7	0.3	1.8	9.5	9	117	118	−3.3	−1.3	0.25	0.25
Brazil	−1.2	0.7	1.7	2	13.3	13	5411	5455	1.5	1.8	2.25	2.75
Canada	0.4	1.1	0.5	0.9	15.5	15	137	138	−1.5	0.5	0.25	0.25
China	0.9	1.2	2	2	5.6	5.5	113	115	5.2	5.2	3.5	3.5
Euro Area	2.9	1.6	0.3	0.6	9.6	9.4	106	106	1.4	1.4	0	0
France	3.2	2.5	−0.1	0.3	11	10.5	105	105	1.4	1.4	0	0
Germany	2	1.5	0.3	1	4.5	4.4	106	107	1.1	1.1	0	0
India	1.5	1.1	5.2	5.2	12	11.7	158	156	3.5	3.5	3.5	3.75
Indonesia	−1.8	−1.8	3.7	3.7	7.3	7.5	108	109	6.6	6.6	3.75	4.25
Italy	4.4	2.9	−0.4	−0.1	12.5	12.1	102	103	1.2	1.2	0	0
Japan	1.1	0.9	−0.4	0.2	4.4	4	102	102	2	2	−0.1	−0.1
Mexico	0.9	1.5	2.7	2.9	4.5	4.3	109	110	−1	1.7	3.5	3.5
Russia	−2	0.6	4	4	7.3	8	616	624	2.5	3.5	4.5	4.5
Saudi Arabia	0.9	1	1.8	1.9	5.5	5.5	100	101	−5.1	10	0.75	0.75
South Africa	−5	0.3	3.7	4	37	36.7	118	120	1.5	1.5	3.25	3
South Korea	1	1	1.4	1.4	4.6	4.4	107	107	1.8	1.8	0.25	0.25
Turkey	1.5	0.9	8.6	7.9	18	17.5	478	486	−2.8	2.5	5.5	5.5
United Kingdom	4.8	1	1.2	1.9	6.8	6.5	110	111	1.6	1.6	0.1	0.1
United States	−3	1	−0.1	0.4	20	19	258	259	1.1	1.1	0.25	0.25

Source: IMF's Statistics data, respective countries' National Statistical Offices, Trading Economics

Table 2: Descriptive Statistics

	GDP Growth Rate		Inflation Rate		Unemployment Rate		Consumer Price Index		Industrial Production		Interest Rate	
	Q4/20	**Q1/21**	**Q4/20**	**Q1/21**	**Q4/20**	**Q1/21**	**Q4/20**	**Q1/21**	**Q4/20**	**Q1/21**	**Q4/20**	**Q1/21**
Mean	0.63	1.015	3.82	4	11.02	10.785	442.9	447	1.01	2.435	3.175	3.225
S.D	2.4029	0.9069	8.8085	8.2412	7.65263	7.531777	1178.4	1188	2.7243	2.4412	7.03434	7.03565
C.V	381.41	89.346	230.59	206.03	69.4431	69.83567	266.06	265.78	269.74	100.25	221.554	218.16
Correlation	0.6277		0.9991		0.999		0.9999		0.0885		0.9996	

Table 3: 5% Level of Significance for a Paired T-Test

	t-value (Calculated value)	t-value (Tabulated value)	Significant/Insignificant
GDP Growth Rate	0.876	1.729	Insignificant
Inflation Rate	1.210	1.729	Insignificant
Unemployment Rate	3.030	1.729	Significant
Consumer Price Index	1.848	1.729	Significant
Industrial Production	1.824	1.729	Significant
Interest Rate	1.285	1.729	Insignificant

**Significant- t-value (Calculated value)>t-value (Tabulated value)*
** Insignificant- t-value (Calculated value)<t-value (Tabulated value)*

Table 4: Stepwise Regression

Dependent Variable: GDP_Q4_20			
Variable	**t-Statistic**	**Prob.**	**Significant/ Insignificant**
Inflation Rate Q4/20	1.92342	0.07501	Insignificant
Unemployment Rate Q4/20	–3.04792	0.00869	Significant
Consumer Price Index Q4/20	–0.37510	0.71321	Insignificant
Industrial Production Q4/20	0.08663	0.93219	Insignificant
Interest Rate Q4/20	–2.00076	0.06520	Insignificant
C	3.62311	0.00277	–

From the above table, the study conclude that Unemployment rate has got a significant impact on GDP growth rate because the probability value is less than 0.05. But the rest four independent variables i.e. Inflation rate, Consumer Price Index, Industrial Production and Interest rate isn't significant since the probability value is greater than 0.05.

Adjusted R-square is 0.518. So, 51.8% of the variation of GDP growth rate (Q4 2020) is due to Unemployment rate (Q4 2020).

F-statistic (Prob) is 0.046. Hence the significance F value is less than 0.05, so F is significant to prove that the model is fit.

2. Dependent Variable: GDP_Q4_21
   Method: Stepwise Regression
   Included observations: 20
   Number of always included-regressors: 6
   Selection method: Stepwise forwards

From the above table, the study concludes that all the independent variables i.e. Unemployment rate, Inflation rate, Consumer Price Index, Industrial Production and Interest rate have got no significant impact on the dependent variable i.e. GDP growth rate.

Adjusted R-square is 0.2204. So, 22.04% of the variation of GDP growth rate (Q1 2020) is due to Independent variables. (Q1 2020).

F-statistic (Prob) is 0.572. Hence the significance F value is more than 0.05, so F is not significant to prove that the model is fit.

Changing postCovid-19 economic shapes of G-20 nations

The cumulative experience of this soaring crisis will lead to the questioning of underlying hypotheses and priorities that will be both an opportunity and a challenge. In this study, we've outlined seven ways of improving the business situation, not only in India but around the world. Taking advantage of these would certainly help to navigate the economically and socially sustainable journey to the next normal. However, to minimize the impact of the shock on financial, Health and Economic sectors and pave the way for a V-shaped recovery, businessmen must be ready to increase the response as situations unfold.

According to the Organisation for Economic Co-operation (OECD) latest economic outlook, Covid-19 pandemic has

Table 5: Stepwise Regression

Dependent Variable: GDP_Q1_21			
Variable	**t-Statistic**	**Prob.**	**Significant/ Insignificant**
Inflation Rate Q1/21	0.21479	0.83303	Insignificant
Unemployment Rate Q1/21	–0.74784	0.46693	Insignificant
Consumer Price Index Q1/21	–0.32137	0.75268	Insignificant
Industrial Production Q1/21	–1.49795	0.15635	Insignificant
Interest Rate R Q1/21	–0.31562	0.75694	Insignificant
C	3.40984	0.00423	–

created the most serious recession in almost 100 years, causing significant harm to the health, employment and well-being of people. The outbreak of Covid-19 and the economic slow down increased the ranks of unemployed Americans by over 14 million, from 6.2 million in February to 20.5 million in May 2020. From the Table 1, it is clearly visible that effect of Covid-19 has been affecting the world economy in term of Unemployment rate. The G20 also decided to step up aid for the development of early warning systems, suitable treatments and vaccines. The Riyadh meet also agreed to help and work closely with the World Health Organization (WHO) to monitor the outbreak, exchange relevant information, facilitate preventive measures, identify early cases and provide clinical care.

At the bottom of the pyramid, government have announced rescue packages for the population via direct benefit transfers (DBT) to their respective accounts. Similarly, sufficient national assistance will help buffer the effect of the corona virus. The central government has already announced some relief packages including support for work equity, alteration of loan re-structuring and credit terms, motivating to enhance consumer spending, etc. Responsible authorities need to facilitate that these rescue bundles are properly implemented by continuous monitoring. Besides providing the vulnerable with robust safety nets, ensuring continuity of employment and job creation is the key. Urgently, resource mobilization is needed to stimulate the economy.

Future Directions for a Post-Pandemic Future

a) Transition to Localisation

As instructed by Shri Narendra Modi, Prime Minister of India, to emphasis on producing and manufacturing of goods and services in India. Each industries focus must be on Made in India projects and missions. For example, Indians has to boycott Chinese goods and 'Made in India' banners written in white on a saffron background, identical to the original colour scheme of the company's logo, have replaced the brand name outside of Mi-stores. Although it is expected to get adaptability to more localization of the goods & services, particularly significant supply chains.

b) Digital gains a significant push

Many organizations have preferred to work staying with certain restrictions remotely and now their employees are 'online' and working from home. It provides a clear and immediate opportunity to drive towards digital world. This crisis simultaneously emphasized the significance of investment in emerging tactics such as cyber security, data analytics and cloud.

c) Blended Learning

Blended learning represents a model that incorporates learning-enhancing technologies and deliver business impact. Mixed learning or 'hybrid learning' is a learning paradigm incorporating both formal (traditional) and non-formal (online) methodologies. While education experts continue to debate the feasibility of blended learning, their presence has forced them to re-evaluate not only the role of technology in (and out) the classroom, but also how to more efficiently reach and educate students.

d) Work from Home mechanism

Making remote employment an option is an investment that can pay off for both employers and employees. Companies embracing telecommuters are able to recruit the best talent without any geographical limitations. Employees who have the ability to work from home or from a remote location are happier, more successful and more loyal to their company. For example, Google would give each employee a $1,000 allowance, or the equivalent value in their country, to spend the required equipment and office furniture, as most of them plan to work mostly from home for the remainder of the year.

e) Switch to variable cost models

From this crisis, the upmost lessons, among others, is the significance of reducing the fixed cost models ongoing in various organizations. For example, companies can decide now what they need to retain in the business, like install security measures to cut insurance and cheaper software so that fixed costs can be minimized.

f) Develop resources for sensing and managing towers:

Companies have recognized the value of sensing technologies, creating accountability through 'digital control towers,' 'digital twins,' and the ability to process structured and unstructured data. For example, companies are now extracting specific data such as road safety, orders for food, e-learning, e-commerce etc. to monitor Covid-19 issues.

g) Resilience in supply chain is vital

Supply chains are at various threats, and they are constantly changing. It is therefore imperative to establish resilience capabilities to react to unpredictable happenings and either revert back quickly to the real state of organization or shift to a different and improved

condition after risk has been impacted and commercial activities continue as effectively as possible.

Conclusions

In short, the crisis is a story with unpredictable ending. Given the large size of the population, the precarious economic situation, particularly of the financial sector in the pre-COVID-19 period, and the dependence of the economy on informal labour, lockdowns and other social distancing measures would be extremely disruptive. The central and state governments have acknowledged and reacted to the challenge but this response should be only the beginning. What is clear is that COVID-19 has created new business environment dynamics that call for a calculated, realistic and informal strategy from political and business leaders. The pandemic's full effects are yet to be measured, though change is already here. We also need to understand that COVID-19 is likely to lead to a new normal-being aware of and planning these trends will allow businesses and economic activities to survive the post-COVID-19 environment.

Competing Interest Statement

All authors have read and approved the manuscript and take full responsibility for its contents. No potential conflict of interest was reported by the author(s).

Acknowledgements

The author(s) would like to thank the reviewers and editors of this manuscript.

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Horizon J. Hum. & Soc. Sci. 2 (S): 83 – 87 (2020)

Journal of Humanities and Social Sciences Research
www.horizon-JHSSR.com

ORIGINAL ARTICLE

Prioritizing Methods and Strategy for e-Learning in Higher Education to Improve Effectiveness

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ARTICLE INFO

Article history

Received: 26-Jun-20
Revised: 25-Sep-20
Accepted: 29-Sep-20
Published: 15-Oct-20

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ABSTRACT

E-initiative is the need of the hour resulted in many initiatives, which has transformed all sectors and higher education is no exception to this due its advantage. In this respect many initiatives has been initiated by Government and private sectors, specially UGC, AICTE etc through NMEICT project for stake holder under its preparedness. But its relevance and its effective utilization needs to be felt and improved as it was an optional earlier. But during the recent lock down, students, teacher across discipline felt its need. Students and teachers are forced to go for these initiatives across India. They have also faced many problems like mindset, digital divide, content, connectivity etc. on the other hand lockdown has also given lesson to how to survive in these situation leads to less travel, less pollution, etc. so there is a need to study the effective utilization of E-initiatives in Higher education during Lock Down, which will highlight Problems and Prospective from different stake holders from larger society prospective. In this paper AHP and Game Theory is being used to prioritize and suggest the best strategy needs to be adopted for e-learning for increasing effectiveness of the system.

Keywords: e-Learning, Priority, AHP, Strategy, Game Theory, effectiveness.

Introduction

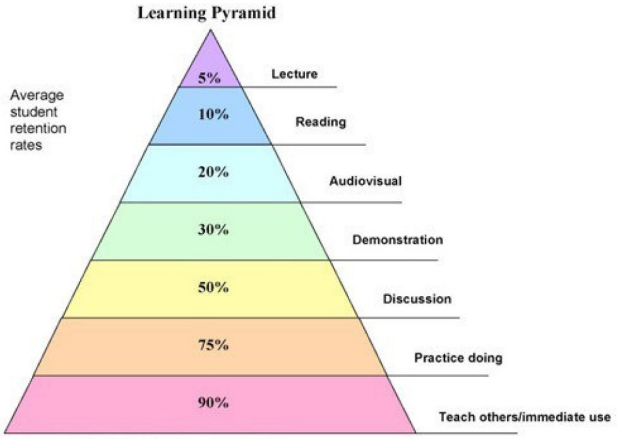
E-education is not new to the society. Organization across the Globe has development suitable e-application to ensure education through online and Government in India is no exception to this. Many such applications have already been development like NPTEL, MOOCs, Swayam to name a few, which were earlier an optional for many. But due to recent Lockdown due to COVID pandemic, all stake holders are being forced by the Agency like UGC, AICTE, MHRD etc to use these initiatives. During this lock down, where all institutions are closed the institution are being directed to continue their education through online and use the various initiatives, so that there will not be any discontinue of education and its related services. As reported by government official the response to this is overwhelming and all institution across the country are using some form of e-learning to ensure continue education. As reported by the ministry various platforms have been developed and used on continuous basis, Diksha education through satellite, e-pathasala open online content for higher education, NROER (National Repository of Open Educational Resources), NIOS (National Institute of Open Schooling), e-yantra a robotics education initiatives for robotic education), FOSSEE (open source software for education, where students can use various software online, virtual labs for using laboratory facilities for various science related subjects, NPTEL portal for online technical education in various subjects and spoken learning programmes for skill development. No doubt the use of these resources has increased in many folds. But many stake holders across the society are facing certain limitation of these initiatives reason for these may be many. On contradictory to this the success is questionable due to non availability suitable devices, like computer and other peripheral and either no or limited internet connectivity have computer with net link. The Covid-19 pandemic has given information about the gap between rural and

urban, male and female, rich and poor in term of availability of various digital facilities and access facilities for the interconnected digital world. So there is a need for extensive study and its effectiveness etc from larger prospective to make it more relevant and effective.

As per literature the e-learning can be broadly classify into computer-based e-learning and internet-based e-learning categories, further (e-students.org) has classified the learning methods into various sub category depending upon its requirement and management like the learning process is completely managed by computer is termed as "Computer Managed Learning (CML)", where as Computer Assisted Instruction (CAI) helps the learner in case of need depending upon uses interaction. In case Synchronous Online Learning both the learner and instructor needs online presence simultaneously and in case of Asynchronous Online Learning this presence is not required simultaneously the learner can take the advantage of own pace, time etc. Author also categories based on its content like in case of Fixed E-Learning the content are fixed irrespective of the learner and leaves no space for learner adaptability, where as in case of Adaptive E-Learning, content are filtered based on learners adaptability. In case the learning behaves Linearly based on the learner and its understanding termed as Linear E-Learning, Interactive Online Learning is similar to the online class room teaching having advantages of interactive learning in presence of group of students but in case Individual Online Learning the online presences is limited to only one learner and teacher, and in Collaborative Online Learning a group of learners and instructor learn together exchanging ideas and methods.

Generally right mixer determines the success of e-learning in Higher education. Researches have development various implementation models for adaptability of the e-learning environment in higher education this can be: Analysis, Design, Develop, Implementation, and Evaluation. In order to improve the effectiveness of the e-learning experience the content needs to be improved and should be need based. In the analysis phase the needs need to be determined. The learning pyramid development by National Training Laboratories Betel, Maine, discussed The Learning Pyramid**,** Designing Learning Contents also depends upon the type of eLearning methods which we choose on the analysis phase.

The learning Pyramid is developed based on the effectiveness of various methods of learning and learner's ability to keep recall and its effective's delivery in case need. Lecture is one ways teaching process having the least effective rate i.e 5%, where as in case of self online



Source: National Training Laboratories, Bethel, Maine.

reading the rate is 10%, audiovisual where both audio and video are present having rate of effectiveness 20% and online demonstration of learning is 30% are the passive learning methods where the learners participation is least. In contrast, the bottom three levels i.e discussion group, practice by doing and teach others are online interaction is an active learning methods having better effective rate. The Learning Pyramid helps the students and the teacher to identify the right methods. The methods also discussed two important types of learning i.e Synchronous and Asynchronous Learning. In synchronous both the stake holder the teacher and students needs to be present for a effective teaching. Synchronous events take place in real time. Synchronous communication between two people requires them to both be present at a given time like chat and IM, video and audio conference, live webcasting, application sharing, whiteboard, polling, and virtual classrooms. Whereas Asynchronous Learning, the presence are not simultaneous but as per convenience and the pace etc depends on learner, which is time independent, like E-mail or discussion forums, Self-paced (SCORM), Audio/Video, E-mail, Discussion forum, Wiki/Blog, Webcasting/Conferencing, CBT and WBT, Simulations, Game-based learning.

Literature Review

e-Learning is the use of information and communication technology to send learning content to the intended user to replicate and increase learning outcome. In the present era with wide presence of internet and intranet there is increase use as this method are having numerous advantage over the traditional method of learning. The learning process involves developing content, storage and enabling retrieval mechanism and its effectiveness also depend upon the individual active involvement

and ability, with many other learning environments to have better outcome. Due to the advantage of own place, pace the e-learning is becoming popular in particular in higher education. However, Guri-Rosenblit (2005) and Robertson (2003) propose that higher learning should rethink their decision on the use due to various reason like cost and its effectiveness. Henry (2001) have found that total e-learning solution have three main components like content, technology and services. Laurillard (2001) and Butson (2003) have found that teaching approach is important then technology medium, similarly Butson (2003) discussed the limitation of e-learnig as it is lack in the area of understand how to think. Initial investments in e-learning are costly, hence the performance, quality, usage, effectiveness and efficiency as a learning solution is of interest to many. However, there is a research gap on the various dimension of e-learning like eavlution and its effective use with its return.

In today's era e-learning has created a new dimension in the learning process and researchers have described it to be learners' learning strategies (Adam et al., 2017; Broadbent, 2017; Littlejohn, Hood, Milligan, & Mustain, 2016; Şahin, Keskin, Özgür, & Yurdugül, 2017). Researcher also described various enablers for effective e-learning environment like online readiness (Park, Lee, & Bae, 2010; Ramli, Muljono, & Afendi, 2018; Yurdugül & Demir, 2017) and motivation (Cull, Reed, & Kirk, 2010; Najafi, Rolheiser, Harrison, & Heikoop, 2018). Different research gap has been pointed out by researcher like absences of student preference, individual factors affecting these preferences (e.g. Butler & Pinto-Zipp, 2005; Tsai, 2005; Yang, & Tsai, 2008). As per literature various factors like Purpose of learning, Availability of e-learning tools, connectivity, content, motivation and adaptability of students, teacher's confidence, way of teaching, availability of other related materials, quality of internet, costing, synchronous and Asynchronous teaching, subjects, E-learning readiness are also the factors for increasing effectiveness of e-learning.

Keeping in view the present situation and increase use of e-learning methods, there is a need to identify effective tool to increase the effectiveness of e-learning or factors affecting the outcome, which in turn can be a help to the manager for improving various e-learning initiatives. This will help them to evaluate and improve the current situation of e-learning. Since the evaluation and decision making process is having many criteria in decision making, Multi-criteria decision-making (MCDM) techniques can be used for Performance Evaluation. This MCDM technique gives better result in the presence of wide range of data and decision criteria decision makers (DMs). Many studies have been conducted on Performance Evaluation based on MCDM techniques including Analytical Hierarchy Process (AHP) Ajami S., Ketabi S., 2012, Gholamzadeh et al., Data Envelopment Analysis (DEA) Ersoy K et al., Yawe B., 2010, Chen Y. et al., and best–worst method (BWM) Liao B. et al., 2019, Haghighi S.M., Torabi S.A., 2018, and many more. Presence of many methods and its wide range of application for performance measurement and there critique, organization are using performance measurement and benchmarking for their improvement in process and to identify better practices for its improvement (Butson 2003).

Methodology

In our study we have taken one subjects of management i.e Operations Research and asked the 20 no of students to rate their mode of preferences (for e-learning) in order of preference separately for Synchronous and asynchronous in the likert scale date. We have used Analytic Hierarchy Process to prioritize the different method of e-learning, the data is being run in the online mode of AHP software available at https://bpmsg.com/ahp/ahp-calc.php. The results for the same are given below. The feedback of the students are recorded in the Table1 and Table 2 for synchronous and asynchronous learning.

Table 1: Decision Matrix for synchronous learning

	1	2	3	4	5
1	1	2.00	4.00	2.00	6.00
2	0.50	1	3.00	4.00	5.00
3	0.25	0.33	1	3.00	5.00
4	0.50	0.25	0.33	1	3.00
5	0.17	0.20	0.20	0.33	1

Results

Priorities

The resulting weights are based on the principal eigenvector of the decision matrix:

	Cat	Priority	Rank	(+)	(–)
1	L1	39.0%	1	18.4%	18.4%
2	L2	29.9%	2	11.8%	11.8%
3	L3	16.4%	3	8.2%	8.2%
4	L4	10.3%	4	5.1%	5.1%
5	L5	4.4%	5	1.4%	1.4%

Consistency Ratio CR = 9.1%

Decision Matrix

Table-2: Decision Matrix for Asynchronous learning

	1	2	3	4	5
1	1	0.50	4.00	2.00	6.00
2	2.00	1	4.00	4.00	5.00
3	0.25	0.25	1	3.00	5.00
4	0.50	0.25	0.33	1	3.00
5	0.17	0.20	0.20	0.33	1

Priorities

These are the resulting weights for the criteria based on pairwise comparisons, the resulting weights are based on the principal eigenvector of the decision matrix

	Cat	Priority	Rank	(+)	(–)
1	L1	29.1%	2	16.3%	16.3%
2	L2	41.1%	1	15.0%	15.0%
3	L3	15.6%	3	8.2%	8.2%
4	L4	9.8%	4	3.3%	3.3%
5	L5	4.4%	5	1.9%	1.9%

Consistency Ratio CR = 9.1%
Principal Eigen value = 5.412, Eigenvector solution: 6 iterations, delta = 2.3E-8

The Consistency Ratio is calculated by dividing the consistency index with random index, If ratio exceeds 0.1, there is a inconsistency in the judgment and CR less than 10 % are accepted and reliable. Since in both the cases the CR are less than 10%, we can accept the result. The result shows that in synchronous mode the method are Live class with Interactive board, Live application sharing, Live video and audio, Live Discussion and QA and Online chat are in order of priority, where as In Asynchronous the Priority list are Computer Assisted training, Simulations Game-based learning, Audio/Video Webcasting/like Youtube, E-mail, Discussion forum, Wiki/Blog

As the effectiveness of e-learning depend upon the mixture of Synchronous and Asynchronous Learning. Finding the right mixture will increase the effectiveness of eLearning. The above problem can be considered as a mixed strategy problem as the effectiveness of the matrix is based on the expected payoff, which may be achieved by combination of the one or more strategy adopted by the e-learning methods. This paper uses Game theory, to so consider the mixed strategy problem and suggested a strategy to be adopted for increasing the effectiveness of the e-learning. Further the students have given the value based on the different strategy is represented in Table-1. In order to find the strategy for the effective utilization of e-learning method, Game Theory was used via online tool https://www.math.ucla.edu/~tom/gamesolve.html.

The value is 7.28. An optimal strategy for Synchronous is: (0.71429,0,0,0,0.28571) and optimal strategy for Asynchronous is: (0,0.85714,0.14286,0,0) The value, 7.28, gives indication that synchronous is better than Asynchronous learning.

Conclusion

It can be concluded that students preferred on line synchronous classes then the Asynchronous classes for the management subject and in order to be more effective there should be only two features in both synchronous and Asynchronous to be more effective.

Competing Interest Statement

The author has read and approved the manuscript and takes full responsibility for its contents. No potential conflict of interest was reported by the author.

Acknowledgements

The author(s) would like to thank the reviewers and editors of this manuscript.

Asynchronous synchronous	Computer Assisted training	Simulations Game-based learning	Audio/Video Webcasting/ like YouTube	E-mail, Discussion forum	Wiki/ Blog
Live class with Interactive board	8	7	9	11	11
Live application sharing	5	2	6	3	9
Live video and audio	1	4	7	8	8
Live Discussion and QA	3	5	9	4	5
Online chat	9	8	3	4	7

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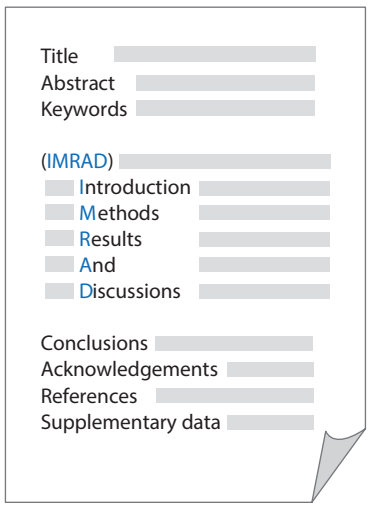

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Horizon Journal of Humanities & Social Sciences Research

Vol. 2 (S) Oct. 2020

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eISSN 2682-9096

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