Impact of Hybrid Work Model on Job Satisfaction of Techies during the COVID-19 Pandemic

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Abstract

The rise of hybrid work models, blending remote and onsite work arrangements, has become increasingly prevalent in today's workforce, especially in the IT industry. The research aims to determine the effects of a hybrid-work model on the job satisfaction of tech professionals, focusing on key factors including onsite work, remote work, flexibility, communication, and safety. Using reliability test, CFA and structural analysis, data collected from a sample of tech professionals was analysed to measure the connection among various work arrangements and satisfaction of job. The findings reveal significant positive associations between job satisfaction for both onsite and remote work. Additionally, flexibility and effective communication emerged as important factors positively influencing job satisfaction among tech workers in hybrid work environments. Furthermore, our study underscores the importance of safety considerations in hybrid work settings. While safety showed a smaller effect size than other factors, it still exhibited a significant relationship with job satisfaction, highlighting the significance of providing a safe and secure work environment for tech professionals. These findings contribute to considering how hybrid work models impact job satisfaction in the technology sector. Employers and organisations can leverage these insights to optimise their hybrid work policies, emphasising flexibility, communication, and safety factors to enhance overall job satisfaction among tech employees.

Keywords: *Hybrid Working Model; Onsite Work; Onsite Work; Onsite Work; Onsite Work; Safety and Job Satisfaction.*

Introduction

The term 'Hybrid' is not unfamiliar, having been utilised in various contexts over the years. In recent times, 'hybrid' has taken on a new connotation, describing the integration of technology into people's daily lives. By April 2020, approximately 81 per cent of professionals found themselves in nations where the termination of businesses was mandated during the pandemic (ILO 2020a). A swift shift from office-based work to remote arrangements, facilitated by adaptable localisation, emerged as a vital resolution. Nevertheless, this transition seemed transient. Telecommuting, often conducted from home offices, has become commonplace, offering increased flexibility in time and location. However, this model entails employees carrying out their duties within the confines of their homes alongside family members, posing challenges to ensuring their rights and welfare efficiently (Wang et al., 2023). It has been observed that employment hours, family responsibilities, and social interactions all overlap (Xue and McMunn, 2021). Due to ongoing lockdowns, individuals have few chances to enjoy leisure activities outside their residences. As an outcome, several workers have exceeded the contractually stipulated maximum number of hours worked, negatively impacting their general comfort and output (Nemțeanu and Dabija, 2023). Como et al. (2021) noted that the current employment environment has adversely affected employee stress levels and overall health. While the traditional eight-hour workday remains widely supported by workers, it is plausible

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to anticipate a growing prominence of nonstandard or alternative work schedules in the post-COVID period, as Bolino et al. (2020) suggested.

The trend toward remote work, whether from home or elsewhere, is expected to endure, with the home office becoming integral to the work landscape. However, have stakeholders considered the preferences of employees? Some employees have changed their mindsets due to the mandated move to remote work, seeing its benefits, while others can be willing to revert to conventional work environments (Vayre et al., 2022). It is critical to comprehend employees' preferences concerning work location and schedule. High levels of productivity, performance, and satisfaction can be sustained in workplaces built with employees in mind and exhibiting organisational resilience. These environments are expected to prosper and remain competitive in the future (Asgari et al., 2022).

Literature Review

Cook et al. (2020) proposed a hybrid work plan that combines conventional office-based work and telecommuting. This approach integrates both traditional and remote work practices, and workers can use ICTs as needed to work from any remote location, like their home, a coffee shop, a co-working space, or a dedicated office area. According to Halford (2005), the dynamics of work, management, and organisation are altered by hybrid work in the organisational, virtual, and home domains. This study emphasises the hybrid work model, which divides professionals' work periods between the workplace and their homes. While there are advantages to both individuals and employers from this combination of in-office and remote work, there are also potential drawbacks due to the unique qualities of each work environment.

The idea of remote work has been studied by many academics, who have looked at how it affects managers, workers, companies, and organisational culture. Customarily, Employees have seen remote work as beneficial since it allows them to complete things outside of the traditional office environment. It enables people to arrange their workday to accommodate personal commitments and handle work-related and non-work-related tasks. Employees who would otherwise have to commute gain from working remotely as well, as it saves them money and time on transportation and provides cost savings for employers through reduced facility expenses. Remote work affords greater flexibility in managing time and can improve concentration and output in a home office setting when specific requirements are satisfied, like visual seclusion, low noise levels, and lack of distractions (Yang et al., 2021). Technology and technical assistance must be available. (Haines et al., 2002). Overall, according to Charalampous et al. (2019), WFH can cultivate a more optimistic perspective, enhance job satisfaction, bolster work commitment, and reduce stress levels among employees.

Conversely, drawbacks of remote work include employee unavailability during crucial times, missed deadlines, reduced flexibility in problem-solving and difficulties in keeping track of workers' performance and availability. The negative consequences of less social contact and more work accumulate over time (Ellison, 1999). Furthermore, it contends that remote workers frequently put in longer hours, exacerbating family dynamics and work-life balance issues. Additionally, working for extended periods without taking enough breaks can harm one's physical and psychological condition, including human complications, pressure, despair, and moods of loneliness (Tavares, 2017).

Physical presence in the office facilitates employee collaboration and face-to-face contact, which has been shown to benefit performance, creativity, and productivity (Čajková et al., 2023). These elements emphasise the major benefits of working in an office or onsite, frequently offering strong arguments to keep these work environments in place. However, the effectiveness of the office environment depends on how it is designed. Open-plan workplaces improve communication and give employers more control over worker performance, but loud environments make it difficult for workers to focus on their work. Furthermore, introverted workers may find it difficult to function in crowded offices, which can cause tension, anxiety, and decreased output (Needle and Mallia, 2021). Furthermore, there can be disadvantages to working from the office, like being closely watched and having less privacy (Ding, 2008).

Some duties no longer require a physical workstation when work dynamics change. Despite being a relatively new phenomenon in professional contexts, hybrid employment is not without its benefits and

pitfalls. It is becoming more and more evident that mixed employment benefits both firms and people. This restructuring of work can improve work-life balance, Zwanka & Buff (2021), since it provides staff more freedom and self-sufficiency to choose their work schedule and location and allows them to manage their personal, professional, and familial responsibilities. Additionally, it improves efficiency, which is a major advantage (Iqbal et al., 2021). Employers can use it to improve employee safety, lower operating expenses related to a reduction in office space, and improve workspace quality and design.

The use of mixed work arrangements has increased in response to the pandemic as companies balance employee health and safety with business continuity. Employee desire for flexible work arrangements has increased, as evidenced by over half of the workers (47 per cent) considering seeking a new job if their current employer did not provide a hybrid work arrangement. The McKinsey American Opportunity Survey, which involved 25,000 Americans and was carried out in partnership with Ipsos, offers distinctive perspectives on how employees are integrating flexible work into their lives and emphasises the increasing demand for hybrid work arrangements (McKinsey, 2022).

AI Riyami et al. (2023) led research to explore the impact of remote work preparations on worker perspectives, particularly focusing on WLB and work motivation (WM). They noted the increasing reliance on WFH globally due to the epidemic and aimed to comprehend the association between Remote Work and WLB while considering mediating elements like work-family conflict (WFC) and job motivation.

In a separate study, John Hopkins et al. (2023) investigated the rising adoption of the effects of hybrid work models on knowledge workers' job satisfaction and work-life balance were investigated. Through semi-structured interviews with Australia's top HR administrators, common hybrid work arrangements and the essential infrastructure and support systems required were identified.

Fiona Niebuhr et al. (2022) examined WFH's impact on German professionals, particularly investigating stress levels, employment competence, and job satisfaction. The study underscored the beneficial effects of adequate technical resources on both job satisfaction and employee well-being by analysing data gathered from a panel survey of workers spanning diverse industries. The findings shed light on potential interventions to improve WFH conditions and stressed the significance of legislative regulations governing remote work arrangements.

Amaya Erro-Garces and colleagues (2022) their findings indicated that a favourable homeworking practice indirectly enhanced well-being by improving (WLB) work-life balance. Additionally, the research highlighted notable variations in telework preferences, implying that individuals who had damaging homeworking practices during COVID might display a reduced inclination towards homeworking in the future.

Tunk, N., and Kumar, A. A. (2023) aimed to understand how different work alignments with HWM influence employees' general well-being and their preferences for work settings. Their investigation focused on various office-based and remote work activities, aiming to provide businesses with valued perceptions for creating upcoming offices that reflect workers' partialities and well-being.

According to Anute, N. B., Kabadi, S., & Ingale (2019), job searchers today have elevated anticipations for recruiters, with technological innovations making the talent acquisition process both simpler and more complex. Recruiters are increasingly utilising social media platforms as marketing tools and additional sources of knowledge for hiring managers and job candidates.

Research Gap

The hybrid work model's influence on the job satisfaction of tech professionals amid the pandemic has received notable attention. While numerous studies have explored various aspects such as onsite work, remote work, flexibility, communication, and safety within this framework, there is a notable research void regarding the complex interrelationship among these elements and their individual effects on job satisfaction. Existing research often provides insights into isolated aspects, such as the advantages of remote

work for work-life balance or the challenges of maintaining team communication in a hybrid setting. However, there is a lack of thorough examination that incorporates these components to offer a full knowledge of their combined influence on IT professionals' job happiness. Additionally, the literature tends to be largely circumstantial or based on short-term observations, lacking longitudinal studies that can capture evolving trends and adaptations over time. Moreover, there is limited exploration into the differential experiences of various demographic groups within the tech workforce, such as gender, age, or job role, which may experience the hybrid work model and its associated factors differently. Addressing these gaps in research is essential for guiding organisational policies and practices aimed at enhancing the well-being and productivity of technology professionals amidst the continuing pandemic and into the future.

Materials and Methods

Research Problem

Adopting hybrid-work models, relating remote and onsite work, presents both opportunities and challenges for tech professionals. While the hybrid work model offers flexibility and autonomy, it also introduces new communication, collaboration, and work-life balance dynamics. Understanding how the hybrid work model influences job satisfaction among tech professionals is essential for organisations seeking to optimise their workforce management strategies and support employee well-being. However, comprehensive studies exploring the several aspects of job satisfaction within the framework of the hybrid work model are scarce, including its effects on individual performance, team dynamics, managerial practices, work-life balance, and organisational culture.

Objectives of the Research

1. To identify the HWM attributes in the IT sector.

2. To evaluate the impact of HWM attributes on tech professionals' job satisfaction.

Hypothesis of the Research

Ho1: There is no significant relationship between HWM attributes and tech professionals' job satisfaction.

Research Methodology

Sampling Design

The techies of particular IT organisations in Pune that produce software make up the sampling unit for this study. A multi-phase sampling process is used. Using Purposive Sampling, six IT companies in Pune are chosen in the first stage. Up to twenty businesses have been contacted to collect the primary data. However, only the following five businesses offered support. Thus, Tech Mahindra, Mindbowser, Synechron, Pubmatic, and Cyient Ltd. are the companies that have been chosen. One hundred employees from each organisation were chosen in the second stage, using convenience sampling, resulting in a sample size of 500 employees. Reliability, structural model, and Confirmatory Factor Analysis are the statistical tools utilised in AMOS.

Results of Data Analysis

Reliability Test

Table 1. Case Processing

		N	Percentage
	Valid	500	100

Cases	Excluded[a]	0	.0
	Total	500	100

Table. 2. Statistics of Reliability

| Cronbach's Alpha	N of Statements
.812	15

Cronbach's alpha is a metric used to evaluate reliability, showing the degree of correlation between statements on a scale or exam. In Table 2, the Cronbach's alpha coefficient for the situation is 0.812, with a scale comprising 15 items. This coefficient suggests a relatively high level of internal consistency among the scale items, suggesting that they measure a common underlying construct or characteristic consistently. Cronbach's alpha scores above 0.70 are generally measured as satisfactory for research purposes; thus, a value of 0.812 indicates good internal consistency reliability for the scale.

Confirmatory Factor Analysis of Hybrid Work Model

Factor Loadings

Factor loadings show, on a scale of -1 to 1, the degree of correlation between a latent variable and an observable variable. A loading of 1 indicates a good progressive association, as a loading of -1 signifies a perfect pessimistic relationship. A loading of 0 specifies no association among the factors. Loadings exceeding 0.5 typically suggest a moderate to strong relationship, while those below 0.5 may indicate a weaker relationship, possibly showing issues such as a poorly defined factor or an observed variable that inadequately measures the underlying construct (Hair et al., 1998). This criterion is a guideline for assessing the strength of connections among experiential and latent variables. In production issues and firm performance, variables are examined for their factor loadings via a path model, as represented in Figure 1 below.
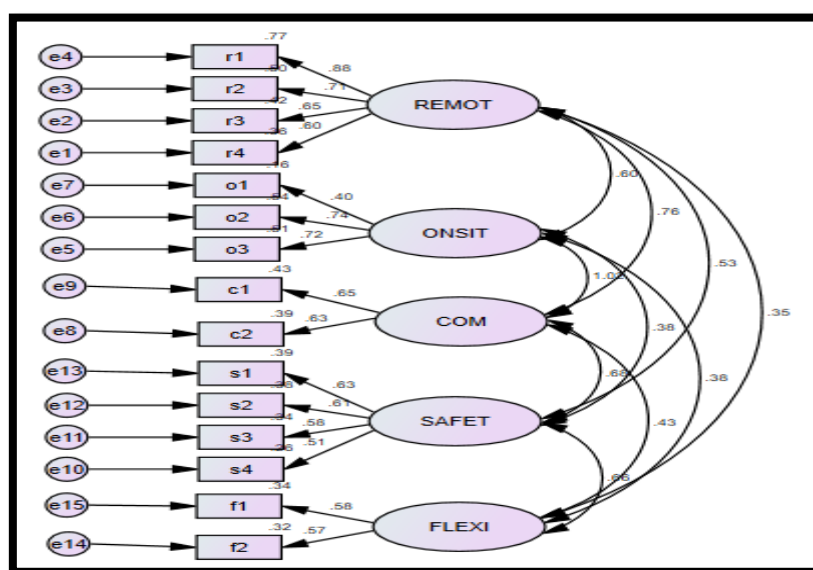
Figure 1. Co-efficient of the path model –Hybrid Work Model (HWM)

Selected Variables Expansion

REMOT (Remote Work), ONSIT (Onsite Work), COM (Communication), SAFET (Safety) and FLEXI (Flexibility).

Table 3. Standardised Regression Weights

Code	Items	Estimate	Item Removed	Variable Name
r4	I possess the essential tools to maintain communication with my colleagues while working remotely.	.599		Remote work
r3	Remote work has led to a decline in my productivity.	.648		
r2	Working remotely enables me to maintain the same level of productivity as I do at my regular work location.	.707		
r1	I am equipped with the necessary resources for remote work success.	.875		
o3	I value collaborative teamwork in my approach to work.	.716		Onsite work
o2	Returning to my office, production facility, or client worksite feels comfortable to me.	.735		
o1	I eagerly anticipate the prospect of returning to my work site.	.398	YES	
c2	Insights gleaned from our virtual work experiences will enhance our organisation's future operations.	.627		Communication
c1	My manager effectively communicates in remote work environments.	.652		
s4	I am clear on my responsibilities for maintaining a healthy and safe work environment.	.508		Safety
s3	I have reviewed and understand the latest organisational health and safety protocols.	.583		
s2	I feel some apprehension about returning to work amidst ongoing Covid-19 concerns.	.613		
s1	I have some reservations about commuting via public transit for travel.	.627		
f2	I prefer attending the office in person.	.569		Flexibility
f1	I am open to being flexible with my working hours.	.582		

In Table 3, factor loadings of less than 0.5, i.e., less than 50%, were removed for further analysis. Onsite work **o1** is considered for analysis as per strong literature survey studies suggestions. The remaining 14 items were considered for further analysis of the path diagram. There is no factor loading issue, and the items were strong enough for further analysis.

Table 4. CFA of Alternate Model

In the context of the Hybrid Work Model (HWM) discussed in Table 4, the analysis encompasses 15 observed and eight latent variables within a sample of 518 participants. The default model, focusing on Hybrid Work Model (HWM), exhibits the following fit indices: The table presents the results of a Confirmatory Factor Analysis (CFA) for an alternate Five-Factor Model. Here is a breakdown of the metrics:

Chi-square (χ2): Measures the extent of difference between the observed data and the model. In this instance, the χ2 value stands at 458.254.

Df (Degrees of Freedom): Represents the model's complexity relative to the number of observed variables and estimated parameters. Here, it is 80.

χ2/Df Ratio: This ratio evaluates the model fit relative to its complexity. A value of 5.728 suggests that there might be some difference between the model and the data.

The TLI (Tucker-Lewis Index): compares the fit of a detailed model to that of a null model. With a TLI value of 0.792, it suggests that the fit of the Five-Factor Model is suboptimal, as it falls short of the commonly accepted value of 0.90.

CFI: operates similarly to TLI, comparing the fit of a detailed model to that of a null model. With a value of 0.841, it indicates a suboptimal fit, falling below the widely accepted value of 0.90.

The RMSEA: quantifies the discrepancy, standardised by degrees of freedom, between the observed and model-predicted covariance matrices. A value of 0.096 suggests that the fit of the Five-Factor Model is suboptimal, surpassing the widely accepted value of 0.08 for model adequacy.

The alternative Five-Factor Model demonstrates a weak fit to the data, as the TLI suggests, CFI, and RMSEA values. Additionally, the relatively high χ2/Df ratio implies possible inconsistencies among the model and the observed data. Advance evaluation and potential model enhancement could be required to enhance its fit.

Structured Model Assessment

The structural model evaluation stands as a crucial phase in Structural Equation Modelling (SEM), where the focus is on unravelling the elaborate associations embedded between hidden attributes inside a theoretical outline. This assessment zeroes in on exploring paths or coefficients, acting as conduits that articulate the causal links between different latent variables. These coefficients indicate the direction and quantify the magnitude of influence that one latent variable exerts on another. Through this nuanced examination, researchers gain valuable insights into the complex web of direct and indirect effects among latent variables, enhancing their understanding of the underlying dynamics.
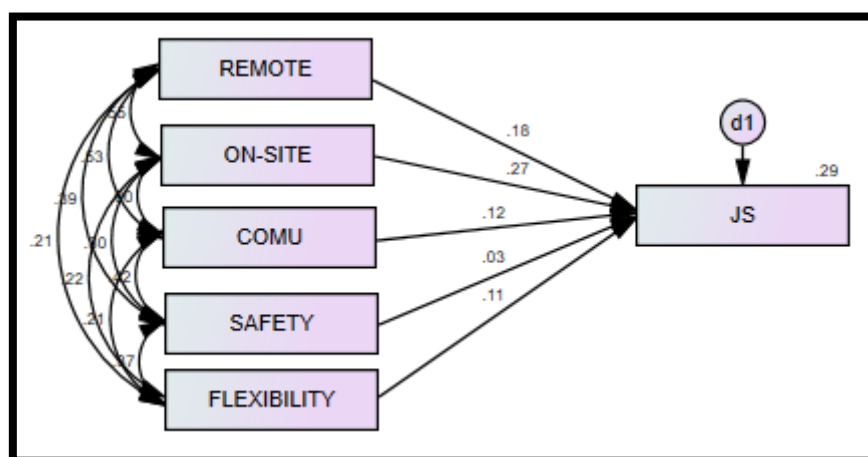

Figure 2. A Structural Equation Model depicting the effect of attributes of the Hybrid Work Model on the satisfaction of tech professionals on the job.

Table 5. Estimating the fit of a structural model

Indices	Suggested Value	Model Fit Indices
CMIN/Df	< 3	2.243
p-value	≥ 0.05	0.000
GFI	≥ 0.90	1.000
AGFI	≥ 0.80	0.816
NFI	≥ 0.90	1.000
CFI	≥ 0.90	1.000
RMSEA	≤ 0.08	0.032
P Close	≥ 0.05	0.000

The assessment of the structural model's fit using various indices in Table 5 suggests a favourable fit to the data. The CMIN/Df value of 2.243 falls below the suggested 3, showing a relatively good fit. The p-value associated with the model's chi-square test is 0.000, implying a significant deviation from the null model and supporting a potentially good fit. The GFI achieves a perfect score of 1.000, showing an excellent fit, while the AGFI, although slightly below the suggested value at 0.816, still suggests an acceptable fit. The NFI and CFI both score a perfect 1.000, surpassing the suggested value of 0.90, showing a strong fit. The RMSEA value of 0.032 is well below the suggested value of 0.08, showing a good fit, and the associated p-value (0.000) suggests a significantly better fit than chance. In summary, these indices collectively suggest that the structural model fits the data well, meeting or surpassing recommended values for most fit indices.

Table 6. Weights of Regression

Dependent		Independent	Estimate	Standard Error	Critical Ratio	Sig.
Job Satisfaction	<---	Remote work	.158	.042	3.786	0.000
	<---	Onsite work	.251	.046	5.465	0.000
	<---	Communication	.103	.043	2.396	0.017
	<---	Safety	.030	.044	1.688	0.000
	<---	Flexibility	.098	.036	2.766	0.002

- **Remote Work:** Table 6 displays an estimated coefficient of 0.158, a standard error of 0.042 and a critical ratio of 3.786. These findings imply that remote work positively affects The statistical significance at the 0.05 level ($p < 0.05$), indicating that job satisfaction tends to improve as remote work increases.

- **Onsite Work:** Table 6 reveals a coefficient estimate of 0.251, with a standard error of 0.046 and a critical ratio of 5.465. These values signify a robust positive association between onsite work and job satisfaction. Furthermore, the relationship attains statistical significance at the 0.05 level ($p < 0.05$), underscoring the notable contribution of onsite work to heightened levels of job satisfaction among individuals in the tech sector.

- **Communication:** Table 6 displays an estimated coefficient of 0.103, a standard error of 0.043 and a critical ratio of 2.396. These findings suggest a positive association between communication and job satisfaction. Significance testing at the 0.05 level ($p < 0.05$) confirms that effective communication significantly influences job satisfaction among technology professionals.

- **Safety:** Table 6 displays an estimated coefficient of 0.030, a standard error of 0.044 and a critical ratio of 1.688. These values suggest a relatively weaker positive relationship between safety and job satisfaction. While the relationship is indeed positive, its statistical significance is observed at a lower level ($p < 0.10$). This implies that safety considerations may have a less pronounced impact than other factors influencing job satisfaction among individuals in the technology industry.

- **Flexibility:** Table 6 indicates an estimated coefficient of 0.098, with a standard error of 0.036 and a critical ratio of 2.766. These findings suggest an affirmative relationship between flexibility and job satisfaction between tech professionals. Importantly, this relationship demonstrates statistical significance at the 0.05 level ($p < 0.05$), showing that greater flexibility in work arrangements correlates positively with increased job satisfaction in the technology industry.

Practical Implications

To accommodate their preferences and needs, offer tech employees the option to work remotely, either full-time or part-time. Allow them to select their preferred work environment, whether it be from home, a co-working space, or the office. Provide the necessary tools, resources, and technology infrastructure to support remote work, including access to secure networks, collaboration platforms, and IT support services.

- Offer flexible onsite work opportunities for tech employees, allowing them to choose when and how often they come into the office. Allow for part-time or rotational schedules where employees can switch between onsite and remote work according to their preferences and work needs.

- Implementing flexible work schedules enables tech employees to manage their work commitments effectively with personal responsibilities and preferences. Offer flexible start and end times, compressed workweeks, or adjusted hours to accommodate different lifestyles and preferences.

- Establish clear and transparent communication channels to keep tech employees informed, engaged, and connected, regardless of their work location. Employ various communication tools and platforms like video conferencing, messaging apps, email, and project management software to streamline collaboration and information sharing among team members.

- Emphasise tech professionals' health, safety, and overall well-being by implementing thorough safety measures and protocols within the workplace. Adhere to recommendations from health authorities and government mandates to establish a secure and healthy work environment, incorporating practices such as physical distancing, sanitation, ventilation improvements, and adherence to mask-wearing policies.

Conclusion

In conclusion, implementing a hybrid-work model that includes components of remote work, onsite work, flexibility, communication, and safety measures is essential for enhancing the job satisfaction of tech professionals. By striking a balance between these key components, IT companies can make a dynamic and kind work setting that meets their employees' diverse needs and preferences. In summary, the regression analysis indicates that both remote work and onsite work significantly contribute to job satisfaction among tech professionals. Effective communication and flexibility also play important roles, even to a slightly lesser extent. Safety, while positively associated with job satisfaction, appears to have a relatively smaller impact than other factors.

References

Aguilera-Hermida, A. P. (2020). College students' use and acceptance of emergency online learning due to COVID-19. *International Journal of Educational Research Open*, *1*, 100011. https://doi.org/10.1016/J.IJEDRO.2020.100011

Azhar, N., & Rani, N. C. A. (2020). Student readiness towards e-learning adoption in higher education: A conceptual model based on extended technology acceptance model. *Journal on Technical and Vocational Education*, *5*(2), 61-74. https://doi.org/10.5539/hes.v6n3p72

Baber, H. (2021). Modelling the acceptance of e-learning during the pandemic of COVID-19-A study of South Korea. *The International Journal of Management Education*, *19*, 100503. https://doi.org/10.1016/j.ijme.2021.100503

Bojović, Ž., Bojović, P. D., Vujošević, D., & Šuh, J. (2020). Education in times of crisis: Rapid transition to distance learning. *Computer Applications in Engineering Education*, *28*(6), 1467-1489. https://doi.org/10.1002/cae.22318

Careaga-Butter, M., Badilla-Quintana, M. G., & Fuentes-Henríquez, C. (2020). Critical and prospective analysis of online education in pandemic and post-pandemic contexts: Digital tools and resources to support teaching in synchronous and asynchronous learning modalities. *Aloma*, *38*(2), 23–32. https://doi.org/10.51698/ALOMA.2020.38.2.23-32

CEPAL-UNESCO. (2020). Education during the COVID-19 pandemic. *Comisión Económica Para América Latina y El Caribe, Santiago - Oficina Regional de Educación Para América Latina y El Caribe de La Organización de Las Naciones Unidas Para La Educación La Ciencia y La Cultura*, *11*, 11−18.

Chapman, D. D. (2011). Contingent and tenured/tenure-track faculty: Motivations and incentives to teach distance. *Online Journal of Distance Learning Administration*, *14*(3), 1-12.

Chetty, R., Friedman, J. N., Hendren, N., Jones, M. R., Porter, S. R., Hall, R., & Hendren Harvard, N. (2018). *The opportunity atlas: Mapping the childhood roots of social mobility*. Retrieved from www.opportunityatlas.orgtract-leveldataisavailableathttps://opportunityinsights.org/data/

Davis, F. D. (1985). A technology acceptance model for empirically testing new end-user information systems: Theory and results. Doctoral dissertation, Massachusetts Institute of Technology.

Davis, F. D. (1989). Perceived usefulness, perceived ease of use, and user acceptance of information technology. *MIS Quarterly: Management Information Systems*, *13*(3), 319–339. https://doi.org/10.2307/249008

Davis, F. D., Al-Suqri, M., & Al-Aufi, A. (1989). Technology acceptance model: TAM. *Information Seeking Behavior and Technology Adoption*, *205–219*.

Edwards, A. L. (1946). A critique of "neutral" items in attitude scales constructed by the method of equal appearing intervals. *Psychological Review*, *53*(3), 159–169. https://doi.org/10.1037/H0054184

Farooq, S., Ahmad, Z., Hassan, N., & Sarfraz Khan, M. (2021). Technology acceptance model for e-learning during covid-19: Empirical insight from pakistan: A technology acceptance model for e-learning during COVID-19: Empirical Insight from Pakistan. *Ilkogretim Online-Elementary Education Online*, *20*(4), 975–984. https://doi.org/10.17051/ilkonline.2021.04.105

Fernández Aráuz, A. (2015). Application of confirmatory factor analysis to a measurement model of academic performance in reading. *Revista de Ciencias Económicas*, *33*(2), 39. https://doi.org/10.15517/rce.v33i2.22216

Green, T., Alejandro, J., Brown, A. H., & Green, T. (2023). International review of research in open and distributed learning the retention of experienced faculty in online distance education program: Understanding factors that impact their involvement the retention of experienced faculty in online distance education programs: understanding factors that impact their involvement.

Gutiérrez-Doña, B. (2008). Structural linear models: Basic concepts, Applications and programming with LISREL. *San José, CR.: Instituto de Investigaciones Psicológicas, Universidad de Costa Rica*.

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and e-learning. *Educause - Frontiers in Education*, *7*, 1-3. https://doi.org/10.3389/feduc.2022.921332

Huang, F., Sánchez-Prieto, J. C., & Teo, T. (2020). The influence of university students' learning beliefs on their intentions to use mobile technologies in learning: A study in China and Spain. In (pp. 3547–3565): Education Tech Research Dev. https://doi.org/https://doi.org/10.1007/s11423-020-09806-0.

Ibrahim, N. K., Al Raddadi, R., AlDarmasi, M., Al Ghamdi, A., Gaddoury, M., AlBar, H. M., & Ramadan, I. K. (2021). Medical students' acceptance and perceptions of e-learning during the Covid-19 closure time in King Abdulaziz University, Jeddah. *Journal of Infection and Public Health*, *14*(1), 17–23. https://doi.org/10.1016/J.JIPH.2020.11.007

Jatmikowati, T. E., Rachman, A. U., & Adwitiya, A. B. (2021). Technology acceptance model in using e-learning on early childhood teacher education program's student during pandemic. *Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini*, *5*(2), 1501–1511. https://doi.org/10.31004/obsesi.v5i2.801

Kumar, B. S., & Kumara, S. S. (2018). The digital divide among the rural and urban students: An exploration. *South Asian Journal of Participative Development*, *18*(2), 160-167.

Lavery, M. P., Abadi, M. M., Bauer, R., Brambilla, G., Cheng, L., Cox, M. A., . . . Kelly, A. E. (2018). Tackling Africa's digital divide. *Nature Photonics*, *12*(5), 249-252.

Lazim, C., Ismail, N. D. B., & Tazilah, M. (2021). Application of technology acceptance model (TAM) towards online learning during covid-19 pandemic: Accounting students perspective. *International Journal of Business, Economics and Law*, *24*(1), 13-20.

Ligorio, M. B., Cacciamani, S., & Cesareni, D. (2020). The acceptance of distance learning: Research in the university context. In P.P. Limone, G.A. Toto, N. Sansone (ed.) Distance university teaching. Between emergencies and the future. In (pp. 91–102). Quaderni di Qwerty, Bari: Progedit.

Mardia, K. V. (1970). Measures of multivariate skewness and kurtosis with applications. *Biometrika*, *57*(3), 519–530. https://doi.org/10.1093/biomet/57.3.519

Messina, D., & García, L. (2020). Diagnostic study on teachers in Latin America and the Caribbean. *Documento de Trabajo*.

Mukminin, A., Muhaimin, M., Diat Prasojo, L., Khaeruddin, K., Habibi, A., Marzulina, L., & Harto, K. (2022). Analyzing social media use in Tefl via the technology acceptance model in Indonesian higher education during the COVID-19 pandemic. *Teaching English with Technology*, *22*(1), 3-22. https://doi.org/10.15659/ppad.15.2.997751

Pal, D., & Vanijja, V. (2020). Perceived usability evaluation of microsoft teams as an online learning platform during COVID-19 using system usability scale and technology acceptance model in India. *Children and Youth Services Review*, *119*, 105535. https://doi.org/10.1016/j.childyouth.2020.105535

Pekrun, R., Goetz, T., Frenzel, A. C., Barchfeld, P., & Perry, R. P. (2011). Measuring emotions in students' learning and performance: The achievement emotions questionnaire (AEQ). *Contemporary Educational Psychology*, *36*(1), 36-48.

Saiyad, S., Virk, A., Mahajan, R., & Singh, T. (2020). Online teaching in medical training: Establishing good online teaching practices from cumulative experience. *International Journal Of Applied And Basic Medical Research*, *10*(3), 149-155. https://doi.org/10.4103/ijabmr.ijabmr_358_20

Sangthong, M. (2020). The effect of the likert point scale and sample size on the efficiency of parametric and nonparametric tests. *Thailand Statistician*, *18*(1), 55-64.

Sukendro, S., Habibi, A., Khaeruddin, K., Indrayana, B., Syahruddin, S., Makadada, F. A., & Hakim, H. (2020). Using an extended Technology Acceptance Model to understand students' use of e-learning during Covid-19: Indonesian sport science education context. *Heliyon*, *6*(11), e05410. https://doi.org/10.1016/J.HELIYON.2020.E05410

Teo, T. (2008). Pre-service teachers' attitudes towards computer use: A Singapore survey. *Australasian Journal of Educational Technology*, *24*(4), 413–424. https://doi.org/10.14742/ajet.1201

Teo, T. (2010a). The development, validation, and analysis of measurement invariance of the technology acceptance measure for preservice teachers (tampst). *Educational and Psychological Measurement 70*(6), 990–1006. https://doi.org/10.1177/0013164410378087

Teo, T. (2010b). Validation of the technology acceptance measure for pre-service teachers (TAMPST) on a Malaysian sample: A cross-cultural study. *Multicultural Education & Technology Journal*, *4*(3), 163-172. https://doi.org/10.1108/17504971011075165

Teo, T. (2014). Unpacking teachers' acceptance of technology: Tests of measurement invariance and latent mean differences. *Computers and Education*, *75*, 127–135. https://doi.org/10.1016/j.compedu.2014.01.014

Teo, T., Lee, C. B., & Chai, C. S. (2007). Understanding pre-service teachers' computer attitudes: Applying and extending the technology acceptance model. *Journal of Computer Assisted Learning*, *24*(2), 128-143. https://doi.org/10.1111/j.1365-2729.2007.00247.x

Vaca-Cardenas, M. E., Meza, J., Estrada, A., & Vaca-Cardenas, L. A. (2020b). *Connectivism as a driver to improve citizen learning in cognitive cities: A literature review.* Paper presented at the The IAFOR International Conference on Education – Hawaii 2020 Official Conference Proceedings. https://doi.org/10.22492/issn.2189-1036.2020.1.

Vaca-Cárdenas, M. E., Ordonez-Avila, E. R., Vaca-Cárdenas, L. A., & Vaca-Cárdenas, A. N. (2024). Students' acceptance toward asynchronous virtual education during COVID-19 pandemic. *Kasetsart Journal of Social Sciences*, *45*(2), 483–492.

Vaca-Cárdenas, M. E., Ordoñez Ávila, E. R., Vaca-Cárdenas, L. A., Vargas Estrada, A., & Vaca-Cárdenas, A. N. (2020a). Connectivism as a potential factor to advertise housing let or sale a multiple case study applied in ecuadorian cities. *Information Technology, Education and Society*, *17*(2), 5–21. https://doi.org/10.7459/ites/17.2.02

World Health Organization. (2020). *WHO coronavirus (COVID-19) dashboard with vaccination data.* Retrieved from https://covid19.who.int/

Yu, S., Luo, L., Kalogiannakis, M., Liu, Q., Hong, X., & Zhang, M. (2021). Preschool teachers' technology acceptance during the covid-19: An adapted technology acceptance model. *Frontiers in Psychology*, *12*, 691492. https://doi.org/10.3389/fpsyg.2021.691492