



Virtual Collaboration And Team Effectiveness: Lessons From Covid-19 Lockdowns

¹Dr. Don-Baridam Letam & ²Akpan, Ekom Etim

¹Department of Management
Faculty of Management Sciences
Rivers State University, Port Harcourt, Nigeria
Letambaridam@gmail.com

²Department of Management
University of Nigeria
Enugu Campus, Nigeria

ABSTRACT

COVID-19 has caused unprecedented challenges to human lives. Many governments have forced people to stay at home, leading to a radical shift from on-site to virtual collaboration for many organizations. Advances in communication and information technology create new opportunities for organizations to build and manage virtual teams. This study attempts to explain the role of virtual collaboration in building team effectiveness (cohesiveness and goal attainment). Data was collected through questionnaire on five-point Likert scale from 98 respondents by using purposive and snowballing sampling techniques. Regression analysis was used to test hypotheses. Results showed that virtual collaboration had strong positive significant relationship with team effectiveness. Hence, the study concludes that virtual collaboration has positive relationship with team effectiveness (cohesiveness, and goal attainment) and thus recommends that firms should give more attention to virtual collaboration to facilitate employee's performance and boost team effectiveness.

Keywords: Team Effectiveness, Virtual Collaboration, Communication, Information Technology, Cohesiveness, Goal Attainment

1. INTRODUCTION

COVID-19 impacted individuals, communities and countries around the world, social and work lives have been abruptly changed and lockdown measures or social distancing has been imposed as a means to reduce the in a bid to curb the spread (Prin & Bartels, 2020). Employees are forced to telecommute and are confronted with numerous technological challenges they may not have prepared for. COVID-19 pandemic impacted many sectors of the global economy, at such these sectors have struggled to adapt to a world where most people-to-people interactions are virtual. Working from home or remote work has experienced significant increase due to the pandemic and this had led to a significant change in work methods (Lambert, Cayouette-Remblière, Guérait, Le Roux, et al., 2020). Digital technology has facilitated the implementation of remote work (Contreras Baykal & Abid, 2020).

Teams are a focal component in organizations and this has been encouraged by studies revealing the positive relations between team-based working and the quality of products and services (Gibson, Porath, Benson and Lawler, 2007). Teams provide variety in information, mentalities, abilities, and experience, whose incorporation makes it possible to offer fast, adaptable, and innovative response to issues and challenges, improving performance and satisfaction of team members. This is the Salas, Rosen, Burke and Goodwin, (2009) called the "wisdom of crowd: increased capacity for increased performance made possible by communication of colleagues". Wuchty, Jones and Uzzi, (2007) state that team effectiveness is a great determinant of organizations success.

A team comprise of individuals who might be geographically and transiently dispersed, communicate and execute concurrent work process to achieve a typical goal (Lee-Kelley & Sankey, 2008;

Mihhailova, Kandela & Turk, 2009). Traditional team members have the advantage of being located at the same place. Therefore, in handling operational tasks through face-to-face collaboration, they can conduct a project in an ad hoc fashion. Operational tasks performed consistently can allow colleagues share information and create implicit terms and shared knowledge. Notwithstanding, organizations are currently confronted with startling endeavors at an operational level because of the COVID-19 pandemic. Virtual collaboration becomes an inspiration for traditional teams as it is based on knowledge sharing through information technology such as zoom, slack, clubhouse, teams, google meet, click-up etc. (Corso, Marini, Pellegrini, Massa & Testa, 2006; Martins, Gilson & Maynard, 2004). Thus, the study seeks to examine how virtual collaboration can improve team effectiveness. However, most teams sometimes fail to achieve high performance as expected, they turn from being mechanisms for effective and satisfactory on collective efforts to being blackholes that consume physical, menta and emotional energies their members (Sims, Salas, & Burke, 2005; Aritzeta & Alcover, 2006). Various factors such as supportive environment, team rewards and cohesiveness affect the team effectiveness which eventually leads to better employee's performance. Maintaining cohesiveness overrides independent thinking as members strive to agree with one another, while goal attainment is the functional approach that concerns the need to "get done" whatever is not being adequately handled for group needs (Syed, & Murray, 2005). The introduction of remote work and virtual collaboration has thus contributed to team members wasting a great deal of effort to attain their goals, therefore the challenge for research involves the effective integration of virtual collaboration to improve team effectiveness.

The current COVID-19 pandemic has generated a huge and abrupt change in how organizations operate. After the episode of COVID-19, social distancing, which implies a conscious physical space between people, has been adopted (Prin & Bartels, 2020) and hence required remote working. Information and communication technologies (ICTs) allow employees to work remotely (Müller & Niessen, 2019). This change has deeply impacted not only how organizations operate but also the relationship between employees and employers. COVID-19 has made drastic changes in the way daily work is done, it has affected work schedule, collaborations and travel, and employees are still working to readjust work-life balance. Albeit virtual collaboration apparatuses for video chat and online meetings have improved since the turn of the century, virtual communication tools are not as great as face-to-face communication. Team creation process and onboarding new members is challenging in a virtual workplace. Hence, with potential risks, opportunities and flexible work plans, team effectiveness cannot be the same (Bouziri, Smith, Descatha, et al., 2020). Employees are asked to telecommute and are compelled to utilize new technologies in new ways to carry out tasks, engage with colleagues, combined with pressing factors of managing home environment that may not be appropriate for work purposes. Hence, understanding employees' virtual collaboration is fundamental with regards to the pandemic.

Statement of Problem

Organizational systems that fail to generate communication satisfaction amongst employees will not foster cohesiveness or goal attainment regardless of the quantity of the information that is transmitted. Operational costs can increase when employees who are working in different geographical locations find it difficult to communicate. Remote working can cause complexities and contribute to misinterpretation of messages by employees, (Okechukwu, Egbo, & Isikuru, 2017). Communication influences employees' attitude that might be emphatically identified with team effectiveness and can be difficult to attain, particularly when team members work for different department or units. Virtual collaboration tries to bridge the gap between working together and working remotely, but there is a lack of facial interaction. It tries to provide an efficient collaboration option but network failure and equipment breakdown might limit its use.

Objectives of the Study

- i. Examine the relationship between virtual collaboration and cohesiveness.
- ii. Ascertain the relationship between virtual collaboration and goal attainment.

Research Questions

- i. What is the relationship between virtual collaboration and cohesiveness?
- ii. How does virtual collaboration relate with goal attainment?

2. Literature Review

Virtual Collaboration

Collaboration is an indispensable part of different organizations and its definition varies. Vallance, Towndrow, and Wiz (2010) characterized collaboration as a group of participants working towards set objectives. Collaboration can take many forms based on size of group or purpose of meeting thus virtual collaboration is one form of collaboration. Coughlin and Kadjer (2009) defines virtual collaboration as an interaction that utilizes variety of techniques for experts to cooperate, gather data, share information and thoughts, encouraging opportunity for team effectiveness and organizational growth. According to Hu, Caron, Deters, et al (2011) virtual collaboration happens when employees learn from one another by sharing information and pondering on common experiences utilizing technology. Forms of virtual collaboration includes but is not limited to email, online gatherings, virtual networks, internet mailing, etc.

Virtual collaboration is usually utilized by universally distributed business. Employees can collaborate through the following medium; videoconferencing, audio-conferencing, instant messaging, text messaging, phone calls, conference calls, conference calls, e-mail, wikis, discussion boards, application-specific groupware, or shared databases etc. Technological developments such as information communication technologies (ICTs), a global talent pool, and a dynamic business environment enable organizations to operate across further distances; and the advent of virtual firm caused a reorientation of business communication from the shift in communication platforms including the incorporation of computer-mediated communication (Caya, Mortensen, & Pinsonneault, 2013). Managers of virtual employees need the skill of communication to engage their employees by using varied communication mediums (Chen, 2012).

Team Effectiveness

Team effectiveness is a team's ability to achieve its objectives, achieves the needs and objectives of its members and sustains itself in an organization (Mc Shane & Glinow, 2003). Teams are more effective than individuals which totally depends on the criteria we use for defining effectiveness in terms of accuracy, team decisions and it contributes for better quality decisions and more creative solutions (Gautam, 2018). Responding to the increasing practice of utilizing work teams in companies, researchers explored team effectiveness in relationship with various team characteristic variables in team studies Team effectiveness is one most important field in performances, (Mathieu, Maynard, Rapp, & Gilson, 2008; Bianco, & Venezia 2019)

McGrath (1964) developed another approach to understanding team effectiveness models, as an input-process-outcome (I-P-O) framework for studying team effectiveness (Dulebohn & Hoch, 2017). Inputs enable and constrain members' interactions such as competencies, personalities, task structure, external leader influences, organizational design features, and environmental complexity. Processes describe how team inputs are transformed into outcomes. Outcomes are valued team results that may include performance (e.g., quality and quantity) and members' affective reactions (e.g., satisfaction, commitment, viability) (Mathieu, et al, 2008).

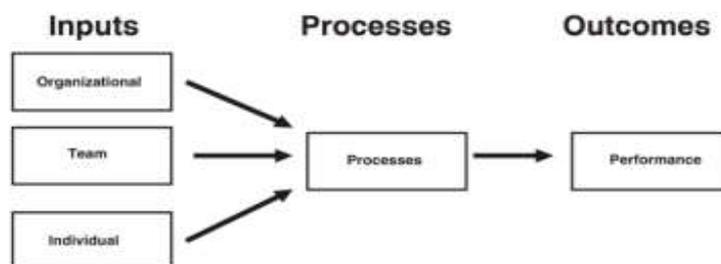


Figure 1: Input-process-outcomes (I-P-O) framework for team effectiveness

Source: Mathieu, et al, (2008).

Another significant model which started out as a criticism of the I-P-O model is the input moderator outcome (IMO) model. This model included time and distinguished among multiple types of processes and outcomes in teamwork (Graaf, Korja & Karjalainen (2009). The IMO models showed that, in the case of P - processes, many of the mediational factors that intervene and transmit the

influence of inputs to outcomes are not processes, but emergent cognitive or affective states, that the I-P-O framework limits research by implying a single-cycle linear path from inputs through outcomes, and that the I-P-O framework tends to suggest a linear progression of main effect influences proceeding from one category to the next, without considering emergent states that develop during team existence and have an impact on team outcomes. (Ulrych, 2014).

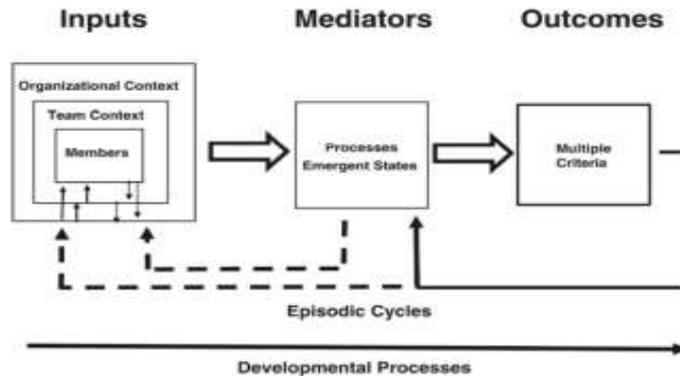


Figure 2: Input-Moderator-Outcome (I-M-O) framework for team effectiveness.

Source: Mathieu, et al, (2008).

Effectiveness of teams starts with meeting performance expectations of those who receive, use, or review the team's output. Teams possess an outstanding impact on performance of employees, studies shows that teams are valuable in every organization as they facilitate the developmental process in the organization and to enhance employees' performance, (Oseiboakye, 2015). The purpose of team is to apply an effective method that seeks to improve performance. Team effectiveness is the existence of synergism between all team members, creating an environment that allows willing employees contribute and participate achieving group objectives, (Tarricone & Luca 2002). Individual become more productive working on teams as they tend to acquire or enhance beneficial occupational skills through unlimited learning, cooperating and exchanging thoughts and various experiences.

Cohesiveness

Cohesion is “a dynamic process which is reflected in the tendency for a group to stick together and remain united in the pursuit of its instrumental objectives and/or for the satisfaction of member affective needs” (Eys, Hardy, Carron, & Beauchamp, 2003). The ‘interpersonal glue’ that makes the members of a group stick together is team cohesion (Nelson & Quick, 2003). When teams are very attractive to their members, individuals value their team membership. The attractiveness of a team to its members is called team cohesion (George & Jones, 2000). Robbins (2000) defines cohesiveness as team members ability to interact with each other and the motivation to stay in the team. Team cohesiveness is the sum of forces attracting team members and keeping the team together. It is a group phenomenon, and for a team to be highly cohesive, team members must possess willingness to remain in the group (Spector, 2000).

Cohesiveness is the feeling of unity that holds a team together voluntarily. Committed team members are more productive, communicative, trusting, motivated and loyal. Teams high in cohesiveness are very appealing to their members; groups low in cohesiveness are not very appealing to their members (George & Jones, 2000). Several factors influence a team's level of cohesiveness, these factors include team size, similarity/diversity team members, competition with other teams, success and exclusiveness of the team (George & Jones, 2000).

Team Size - Large teams have the greatest potential for conflict, and members find it difficult to form close ties with each other. A small or medium size tends to promote cohesiveness.

Similarity/Diversity of team members - teams tend to be most cohesive when team members are homogeneous or share certain attitudes, values, experiences and other characteristics.

Competition with other teams - Competition between teams in an organization increases team cohesiveness when it motivates members of each team to bond together to achieve group goals

Success - When groups are successful in achieving their goals, they become especially attractive to their member, and group cohesiveness increases

Exclusiveness - A team's exclusiveness is indicated by how difficult it is to become a member of the team, the extent to which outsiders look up to team members, the team's status in the organization, and the special rights and privileges accorded team members.

Goal Attainment

Goal attainment requires the contributions of all team members, their determination to reach these goals would lead them to support each other in order that everyone in the work team contribute to task accomplishment. Goal attainment is also known as goal accomplishment and is the ability to identify and prioritize activities in order to maximize output and meet set objectives (Zaccaro, & Lowe 2015). Teams can execute plans to get desired results as goal attainment is the end result of team members leading themselves. Team effectiveness is appraised in terms of the accomplishment of ends rather than means at such the effectiveness of a team is measured in terms of the degree to which these goals are achieved. Information elaboration could likewise assist with beating the vulnerability that goes with goal ambiguity, or an absence of goal clarity, as team communication assists with making a mutual understanding of the group objectives and to focus efforts toward goal attainment, (Marieke, Sandra, & Ben, 2018). Team members could acquire a superior hold on their work following from this explanation, which helps center around the street to arrive at the destinations and improves the odds of achievement.

Clearness of proposed objectives is vital in teams goal attainment. To accomplish significant level of performances, it is fundamental that team members have objectives that are explicit, quantifiable, conceded to, genuine, and time bounded, and that there is management system for monitoring, evaluating, controlling and giving feedback. Team goals were found to be positively related to team performance on business goal achievement, schedule performance, and team potency (Le Blanc, González-Romá & Wang, 2020; Hu, & Liden 2011).

Virtual Collaboration and Cohesiveness

Team cohesiveness depends largely on effective communication. Virtual collaboration allows for effective communication and the (Berry, 2011; Daniel, 2010). Clarity in communication and knowledge transfer between employees can reduce frustration and time required to complete a project and knowledge creation is one of the most important attributes for modern organizations because knowledge is a critical foundation of competitive advantage (Wang, Su, & Yang, 2011). Creating and retaining knowledge allows organizations to compete with other companies in modern business environment. Hence, we hypothesize that:

Ho₁: There is no significant relationship between virtual collaboration and cohesiveness.

Virtual Collaboration and Goal Attainment

Virtual collaboration is widely used in corporate businesses for its efficiency, innovation, and ability to gain or keep competitive advantages in the market. Organizations commonly use virtual collaboration tools to facilitate problem-solving between employees within the firm, and also to collaborate with another firm. Gergle, Kraut and Fussel, (2012) states that virtual collaboration increases operations efficiency. For example, IBM, one of the leaders in using virtual collaboration to promote business processes, has developed many systems to help employees collaborate more easily across boundaries. IBM's use of virtual collaborative spaces, such as 3-D meeting rooms and use of avatars, the virtual universe community provides employees with a way to collaborate which has resulted in more production (Cherbakov & Luba, 2009). Based on these arguments, the study hypothesizes that:

Ho₂: There is no significant relationship between virtual collaboration and goal attainment.

Operational Framework for the study

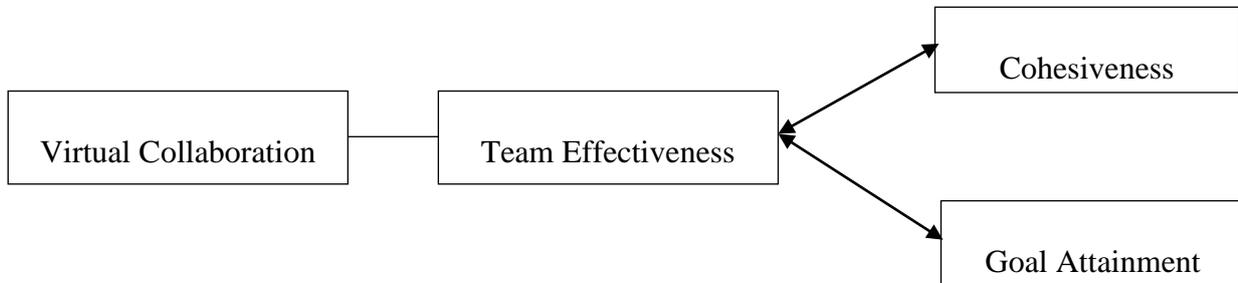


Figure 3: Operational framework for the study

Source: Conceptualized by the Researcher, 2021. Measures of team effectiveness were adapted from Syed, & Murray, (2005).

3. METHODOLOGY

Research Design and Population of the Study

The accessible population is made up of 98 respondents who were selected using purposive and snowballing sampling techniques. Snowballing and purposive sampling are both non-probability sampling techniques. While snowballing sampling technique is a situation where existing study subjects recruit future subjects from among their acquaintances; purposive sampling technique selects a sample based on characteristics of a population and the objective of the study. Copies of the questionnaire were administered to the respondents via email and personal contacts out of which 89 copies representing 90.8 percent were correctly filled and used for further analyses.

Operational Measures of Variables

The independent variable virtual collaboration, was studied as a unidimensional construct and measured using a 5-item scale including “All in all, I am satisfied with virtual work; Virtual work allows me to perform my job better than I ever could when I worked in the office”. These items were adopted extracted from Raghuram, Garud, Wiesenfeld, and Gupta (2001).

The dependent variable is team effectiveness which was measured using a 12-item scale which were carefully selected to reflect the measures (cohesiveness and goal attainment). Among the items include “My team is united in trying to reach goal; Team problem solving results in effective solutions. My team has mechanisms in place to monitor its results”. The items for team effectiveness were adopted from Chang, Duck, and Bordia, (2006).

4. RESULTS AND DISCUSSIONS

Table 1 below shows the descriptive statistics of the correspondents. Gender indicates that there are more female respondents 65(72.6%) than male respondents 24(27.4%). Marital status shows that 46(52.2%) of the study respondents are single while 43(47.8%) are married. Age distribution shows that 22(24.7%) respondents are between the ages of 20 – 35 years, 38(42.7%) respondents are between 36 – 50 years while 29(32.6%) respondents are equal to or greater than 51 years of age. Years of experience indicates that most of the respondents have spent between 6-10 years (44.9%) with their organization, followed by respondents who have spent 0 - 5 years 29(32.4%) and lastly those who have worked for 11 years and above 20(22.7%). Educational qualification distribution shows that 8(9.2%) have obtained WAEC/OND/NCE, 53(59.3%) have obtained HND/B.Sc. while 28(31.5%) have obtained Master’s Degree or above. Thus, it could be concluded that the study respondents are highly educated. This could be attributed to the high technological adoption.

Table 1: Analysis of Demographic Profiles of Respondents

Variable	Item	Frequency	Percent (%)
Gender	Male	24	27.4
	Female	65	72.6
Marital Status	Married	43	47.8
	Single	46	52.2
Age	20 – 35 Years	22	24.7
	36 – 50 Years	38	42.7
	51 Years & Above	29	32.6
Years of experience	0 – 5 Years	29	32.4
	6 – 10 Years	40	44.9
	11 Years & Above	20	22.7
Educational Qualification	WAEC/OND/NCE	8	9.2
	HND/B.Sc.	53	59.3
	MSC & Above	28	31.5

Source: Field Data, 2021.

4.1 Statistics Data Analysis

Spearman’s rank order correlation coefficient was used in testing hypotheses in the study. This was carried out through SPSS 26 software. The decision rule: reject null hypothesis if p-value obtained is less than the alpha value of 0.05 and accept the null hypothesis when p-value is greater than the alpha value (0.05).

Test of Hypothesis one: There is no significant relationship virtual collaboration and cohesiveness

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.792 ^a	.627	.623	.63398

a. Predictors: (Constant), Virtual Collaboration
SPSS output, Version 26

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	58.852	1	58.852	146.421	.000 ^b
	Residual	34.968	87	.402		
	Total	93.820	88			

a. Dependent Variable: Cohesiveness
b. Predictors: (Constant), Virtual Collaboration
SPSS output, Version 26

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients		t	Sig.
		B	Std. Error	Beta			
1	(Constant)	1.940	.180			10.799	.000
	Virtual Collaboration	.643	.053	.792		12.100	.000

a. Dependent Variable: Cohesiveness
SPSS output, Version 26

Result shows a strong positive statistically significant relationship between virtual collaboration and cohesiveness (0.792). This implies that virtual collaboration accounts for 63% variation in cohesiveness which is a measure of team effectiveness. The ANOVA table indicates that the regression model significantly predicts the dependent variable. The results reveal that the regression model statistically and significantly predicts the outcome of the variables where P = 0.000 which is less than 0.5. The Coefficient table shows a positive relationship between the variables. The null hypothesis was rejected and the alternate hypotheses accepted. Thus, there is a significant relationship between virtual collaboration and cohesiveness.

Test of Hypothesis two: There is no significant relationship virtual collaboration and goal attainment

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.889 ^a	.790	.788	.64722

a. Predictors: (Constant), Virtual Collaboration
SPSS output, Version 26

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	137.062	1	137.062	327.200	.000 ^b
	Residual	36.444	87	.419		
	Total	173.506	88			

a. Dependent Variable: Goal Attainment
b. Predictors: (Constant), Virtual Collaboration
SPSS output, Version 26

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.300	.183		-1.639	.105
	Virtual Collaboration	.981	.054	.889	18.089	.000

a. Dependent Variable: Goal Attainment
SPSS output, Version 26

Result shows a very strong positive statistically significant relationship between virtual collaboration and goal attainment (0.899). This implies that virtual collaboration accounts for 79% variation in goal attainment which is a measure of team effectiveness. The Anova table indicates that the regression model significantly predicts the dependent variable. The results reveal that the regression model statistically and significantly predicts the outcome of the variables where P = 0.000 which is less than 0.5. The Coefficient table shows a positive relationship between the variables. The null hypothesis was rejected and the alternate hypotheses accepted. Thus, there is a significant relationship between virtual collaboration and goal attainment.

4.2 DISCUSSION OF FINDINGS

The result from the study reveals a significant relationship between virtual collaboration and team effectiveness. Hence the hypotheses that there is no significant relationship between virtual collaboration and cohesiveness was rejected and its alternative accepted. Virtual collaboration creates a decrease in the sense of being isolated from colleagues, it provides online social connectivity. Studies found that virtual collaboration is an effective means for professional development amongst team members and it helps decrease isolation (Scribner-MacLean & Miller, 2011; Dolan, 2011; Puzifferro- Schnitzer, 2005).

The study further reveals that virtual collaboration is associated with goal attainment and increased productivity. This is in consonant with Pavlova, (2019) who concludes that work through free choice to directly influence one's working time, place, and methods is associated with higher productivity, also Kloptek, (2017) concludes that a less formal working atmosphere reduces the work stress for employees, thus virtual collaboration helps employees create their own rhythm of work and prevents distractions from other employees.

Ale, Ahmend and Taha (2011) investigated the management challenges associated with virtual teams. They conclude that the virtual environment is one means for achieving increased responsiveness. Also, Howells, James, & Malik (2003) in their study sourcing of technological knowledge, conclude that the shift from serial to simultaneous parallel working has become more common. Based on the above, companies progress can be sustained through virtual interaction, communication and collaboration.

5. CONCLUSION AND RECOMMENDATIONS

The findings of this study show that virtual collaboration accounts for an increase in team effectiveness, thus, there is need for employees to pay attention to the structure and nature of collaboration and communication flows in order to manage team members effectively. It is obvious that COVID-19 has fundamentally affected work processes, the pandemic has abruptly accelerated the speed of changes associated with working outside of co-located offices. Results from the study demonstrates that virtual collaboration affects employee efficiency. High-performing teams will progress admirably, as compared to teams with communication challenges. Employees prefer to work remotely without the need to commute to a physical office even if the COVID-19 pandemic dies down (Zippia, 2020).

Virtual collaboration allows for more efficient working and better possibilities to communicate effectively, increase work-life balance and work motivation, however it had worsened ergonomics and decreased social interaction. Virtual collaboration can be considered as an efficient way of working which has its benefits but also some challenges. It is important for organizations to have a virtual collaboration framework as remote workplace management is not that different from an office workplace management. It still requires understanding of the nature of human motivation and behaviour and with the different workflow, there is need to change some of the usual work practices.

Thus, the study recommends that organizations should give more attention to virtual collaboration by establishing instructions and recommendations to guide it as it would serve as support to employees which can increase their performance level and boast team effectiveness. Virtual work practices are likely to spread as employees now have to be connected technologically.

The massive, abrupt and mandatory switch to remote work has led employees to adapt to virtual collaboration, adopting the practice post-pandemic. Organizations need to invest in the development of current and potential employees to build new skills to function effectively in new work settings. Additionally, organizations ought to give opportunity to non-task communications among employees as it permits emotional connections and bonding to continue among colleagues. Organizations should adopt and encourage routines that enhance trust while being attentive to the costs of increased monitoring.

6. Limitations

The study was limited by several factors. First, data were collected from only 89 respondents, hence the findings may not be generalized. Future studies may expand the scope of this study by including more respondents. Secondly, data collected were tested using regression analysis which only test for effect of one variable on another. Hence, future studies should use higher statistical analysis techniques such as part analysis or structural equation analysis. Thirdly, the study only used quantitative data without considering qualitative data such as interviews or panel discussions. This may limit the information supplied by the respondents as they were restricted to only the questions contained in the structured questionnaire. Thus, it is suggested that future studies should triangulate their data.

REFERENCES

- Ale E.N., Ahmed, S., & Taha, Z., (2011) Virtual teams and management challenges. *Academic Leadership Journal*, 9(3), pp. 1-7.
- Aritzeta, A., & Alcover, C.M. (2006). Quién decide Quién es responsable Quién gana Análisis de las dificultades para la implementación de equipos de trabajo. *Revista de Psicología del Trabajo y de las Organizaciones*, 22, 151-178
- Berry, R. G. (2011). Enhancing effectiveness on virtual teams: Understanding why traditional team skills are insufficient. *Journal of Business Communication*, 2(48), 186–206. doi:10.1108/0021943610397270
- Bianco, F., & Venezia, M. (2019). Features of R&D Teams and innovation performances of sustainable firms: Evidence from the “sustainability pioneers” in the IT hardware industry. *Sustainability*, 11, 4524.

- Bouziri, H., Smith, D. R., Descatha, A., Dab, W., & Jean, K. (2020). Working from home in the time of Covid-19: how to best preserve occupational health? *Occupat. Environ. Med.* 77, 509–510. doi: 10.1136/oemed-2020-106599
- Caya, O., Mortensen, M., & Pinsonneault, A. (2013). Virtual teams demystified: An integrative framework for understanding virtual teams. *International Journal of e Collaboration*, 9(2), 1-33
- Chang, A., Duck, J., & Bordia, P. (2006) Understanding the multidimensionality of group development. *Small Group Research* 37(4). 327-350.
- Chen, C. A. (2012). Explaining the difference of work attitudes between public and nonprofit managers: The views of rule constraints and motivation styles. *The American Review of Public Administration*, 42, 437-460.
- Cherbakov, L. (2009). *Virtual spaces: Enabling immersive collaborative enterprise*, Part 1: Introduction to the Opportunities and Technologies. IBM, 30 June
- Contreras, F., Baykal, E. & Abid, G. (2020). E-leadership and teleworking in times of COVID-19 and beyond: What we know and where do we go. *Front. Psychol.* 11:590271. doi: 10.3389/fpsyg.2020.590271
- Corso, M., Martini, A., Pellegrini, L., Massa, S. and Testa, S. (2006) Managing dispersed workers: the new challenge in Knowledge Management, *Technovation*, 26, 583-594.
- Coughlin, E., & Kadger, S. (2009). *The impact of online collaborative learning on educators and classroom practices*. Los Angeles, CA: Cisco Systems
- Daniel, J. L. (2010). The effect of workplace spirituality on team effectiveness. *Journal of Management Development*, 29(5), 442–456. doi:10.1108/02621711011039213
- Dolan, V. (2011). The isolation of online adjunct faculty and its impact on their performance. *International Review of Research in Open and Distance Learning*, 12(2), 62-77.
- Dulebohn, J.H., & Hoch, J.E. (2017) Virtual teams in organizations. *Hum. Resour. Manag. Rev.* 27, 569–574.
- Eys, M.A., Hardy, J., Carron, A.V., & Beauchamp, Mark R., (2003). *The Kinesiology and Physical Education Faculty Publications*. 20
- Gautam, H.P. (2018). Team effectiveness and perceived employees’ performance in Nepalese service sector. *International Journal of Research in Business Studies and Management*, 5(2), 1-10
- George, J.M. & Jones, G.R. (2000). *Essentials of managing organizational behavior*. New Jersey: Prentice Hall
- Gergle, D., Kraut, R.E., & Fussell. S.R., (2012). Using visual information for grounding and awareness in collaborative tasks. *Professional Communication, IEEE Transactions.* 45(4), 219-230.
- Gibson, C., Porath, C., Benson, G., & Lawler, E. (2007). What results when firms implement practices: The differential relationship between specific practices, firm financial performance, customer service, and quality. *The Journal of Applied Psychology*, 92. 1467-80. 10.1037/0021-9010.92.6.1467.
- Goodwin, G., Burke, S., Wildman, J., & Salas, E. (2009). *Team effectiveness in complex organizations: Cross-disciplinary perspectives and approaches*. Routledge/Taylor & Francis Group
- Graaf, D., Koria, M., & Karjalainen, T. (2009). *Modelling research into cross-functional team effectiveness*. In Proceedings of the IASDR Conference, Seoul, Korea, 18–22, 2363–2372.
- Howells, J., James, A., & Malik, K. (2003). The sourcing of technological knowledge: distributed innovation processes and dynamic change. *R&D Management*, 33, 395 - 409
- Hu, J., & Liden, R.C. (2011) Antecedents of team potency and team effectiveness: An examination of goal and process clarity and servant leadership. *J. Appl. Psychol.* 96, 851–862
- Hu, R., Caron, T., Deters, F., Moret, L., & Swaggerty, E. (2011, March). Teacher educators teaching and learning together: A collaborative self-study of support within an online literacy learning community. *MERLOT Journal of Online Learning and Teaching*, 7(1), 57-67.
- Kłopotek, M. (2017). The advantages and disadvantages of remote working from the perspective of young employees. *Organiz. Manage.* 4, 39–49. doi: 10.29119/1899-6116.2017.40.3

- Lambert, A., Cayouette-Remblière, J., Guéraud, É, Le Roux, G., Bonvalet, C., Girard, V., et al. (2020). How the COVID-19 epidemic changed working conditions in France. *Popul. Societ.* 579, 1–4.
- Le Blanc, P.M., González-Romá, V., & Wang, H. (2020) Charismatic leadership and work team innovative behavior: The role of team task interdependence and team potency. *J. Bus. Psychol.* 11, 7–12.
- Lee-Kelley, L., & Sankey, T. (2008) Global Virtual Teams for value creation and project success: A case study, *International Journal of Project Management*, 26, 51-62.
- Marieke, V., Sandra, G., & Ben, K., (2018) Goal Setting in Teams: Goal Clarity and Team Performance in the Public Sector. *Review of Public Personnel Administration*. 38(4) 472–493
- Martins, L.L., Gilson, L.L., & Maynard, M.T. (2004) Virtual Teams: What do we know and Where do we go from here? *Journal of Management*, 30, 6, 805-835.
- Mathieu, J., Maynard, M.T., Rapp, T. and Gilson, L. (2008) Team Effectiveness 1997-2007: A Review of Recent Advancements and a Glimpse into the Future. *Journal of Management*, 34, 410-476. <http://dx.doi.org/10.1177/0149206308316061>
- McGrath, J. (1964) *Social Psychology: A Brief Introduction*. Holt, Rinehart & Winston, New York.
- McShane, S.L. & Von Glinow, M.A. (2003) *Organizational Behaviour*. International Edition, McGraw-Hill Education, New York.
- Mihhailova, G., Kandela, O. & Turk, K. (2009) *Virtual work and its challenges and types*. The Business Review Cambridge, 12, 2, 96-103.
- Müller, T., & Niessen, C. (2019). Self-leadership in the context of part-time teleworking. *J. Organiz. Behav.* 40, 883–898. doi: 10.1002/job.2371
- Nelson, D.L. & Quick, J.C. (2003). *Organizational Behavior: Foundations, Realities and Challenges*. Fourth edition. Ohio: Thompson
- Okechukwu, E. U., Egbo, D. E., & Isikuru, H. O. (2017). Effect of Virtual Management on Employee Performance in Selected E-Business Firms in Lagos State, Nigeria. *International Journal of Academic Research in Economics and Management Sciences*, 6(3), 214–229.
- Oseiiboakye, E. (2015). *Research on the Impact of Teamwork on Employee Performance*. University of Ghana.
- Pavlova, O. (2019). The impact of flexible working arrangements on competitive advantages of organization. *Vilnius Univ. Open Ser.* 2019, 55–61. doi: 10.15388/OpenSeries.2019.18404
- Peters, L., & Manz, C. (2007). Identifying antecedents of virtual team collaboration. *Team Performance Management*. 13. 117-129. 10.1108/13527590710759865.
- Prin, M., & Bartels, K. (2020). Social distancing: Implications for the operating room in the face of COVID-19. *Can. J. Anaesthes.* 67, 789–797. doi: 10.1007/s12630-020-01651-2
- Puzziferro-Schnitzer, M. (2005). Managing virtual adjunct faculty: Applying the seven principles of good practice. *Online Journal of Distance Learning Administration*, 8(2), 21-36.
- Raghuram, S., Garud, R., Wiesenfeld, B., & Gupta, V. (2001). Factors contributing to virtual work adjustment. *Journal of Management*, 27, 383–405.
- Robbins, S.P. (2000). *Organizational Behavior*. Ninth edition. New Jersey: Prentice Hall.
- Scribner-MacLean, M., & Miller, H. (2011). Strategies for success for online co-teaching. *MERLOT Journal of Online Learning and Teaching*, 7(3).
- Sims, D.E., Salas, E., & Burke, C.S. (2005). *Promoting effective team performance through training*. In S.A. Wheelan (Ed.), *The Handbook of Group Research and Practice* (pp. 407-425). Thousand Oaks, CA: Sage
- Spector, P.E. (2000). *Industrial and Organizational Psychology: Research and Practice*. Second edition. New York: John Wiley.
- Syed, J. & Murray, P., (2005). Critical issues in managing age diversity in Australia. *Asia Pacific Journal of Human Resources*, 43(2), 210–224. <https://doi.org/10.1177/1038411105055059>
- Tarricone, P. Luca, J. (2002). *Successful teamwork: A Case Study*. Edith Cowan University, Perth, Australia.
- Ulrych, W. (2014) *The Constraints and Problems in Team Performance Management*. Zesz. Nauk. Univ. Ekon. Krakowie, 933, 95–108.

- Vallance, M., Towndrow, P., & Wiz, C. (2010, January/February). Conditions for successful online document collaboration. *TechTrends*, 54(1), 20-24.
- Wang, D., Su, Z., & Yang, D. (2011). Organizational culture and knowledge creation capability. *Journal of Knowledge Management*, 15(3), 363–373. doi:101108/13673271111137385
- Wutchy, S., Jones, B.F., & Uzzi, B. (2007). The increasing dominance of teams in production of knowledge. *Science*, 316, 1036-1039
- Zaccaro, S.J., & Lowe, C.A. (2015). Cohesiveness and performance on an additive task: ce for multidimensionality. *Journal of Social Psychology*, 128, 547-558.
- Zippia, P. (2020) *Half of American workers would rather work from home forever*. <https://www.zippia.com/advice/coronavirus-remote-work-survey/>.

APPENDIX 1

Questionnaire On: Virtual Collaboration And Team Effectiveness: Lessons From Covid-19 Lockdowns

Section A

Personal Data:

1. Gender: Male Female
2. Age: 20-35 36-50 51 Above
3. Marital status: Single Married
4. Educational Qualification: WAEC/OND/NCE HND/B.Sc. MSC/PhD
5. Years of work experience: 0-5 6-10 11 and Above

Section B

Indicate the extent to which you agree or disagree that reflects the situation in your organization:

Virtual Collaboration

Please tick one choice for each of the following statements.

(1 = strongly disagree, 2 = disagree, 3 = nor disagree nor agree, 4 =agree, 5 = strongly agree)

S/N	Virtual Collaboration	5	4	3	2	1
1	The social events in my office are adequate to build a sense of community.					
2	The work-related meetings in my office are adequate to build good working relationships.					
3	All in all, I am satisfied with virtual work.					
4	Virtual work allows me to perform my job better than I ever could when I worked in the office.					
5	If I were now given the choice to return to traditional office environment (i.e. no longer telework), I would be very unlikely to do so.					

Team Effectiveness

Please tick one choice for each of the following statements.

(1 = strongly disagree, 2 = disagree, 3 = nor disagree nor agree, 4 =agree, 5 = strongly agree)

S/N	Cohesiveness	5	4	3	2	1
1	United in trying to reach goal					
2	Team members take personal responsibility for the effectiveness of our team.					
3	Everyone tries to help if members have problems					
4	Team members communicate freely about each other's responsibility					
5	Stick together outside of the team project					
6	Team members like to spend time outside of work hours					
	Goal Attainment					
7	Team members clearly understand their roles.					
8	Team problem solving results in effective solutions.					
9	Team members maintain a can-do approach when they encounter frustrating situations.					
10	As a team, we are continually working to improve cycle time, speed to market, customer responsiveness, or other key performance indicators.					
11	Team members frequently go beyond what is required and do not hesitate to take initiative.					
12	Our team has mechanisms in place to monitor its results.					