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How to have an effective Online Teamwork Training, engaging employees through a supportive environment, in times of Covid-19

Ilaria Valenza

Master in Human Resource Management and Organizational Consultancy

Supervisor:

Prof. PhD Carla Alexandra Silva Rebelo, Professora Auxiliar Convidada

Department of Human Resources and Organizational Behavior (IBS)

November, 2021



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Abstract

Nowadays online training is becoming crucial in employee's life, this phenomenon already started in the last decade, however due to the current pandemic situation, companies had to improve and to update their tools to provide efficient training even during lockdown.

This cross-sectional study (N=200) aims to identify the elements that, in online training settings, can be applied to implement the effectiveness of the training. We hypothesized that interactivity, as a characteristic of training, was positively related to the effectiveness of online teamwork training. Therefore, we supposed that a supportive working environment was positively connected to the efficacy of the training process. A regression analysis between those variables demonstrated the existence of these relations.

Moreover, we hypothesized that the variable engagement was working as a mediator between interactivity and the effectiveness of training, but also between the variable supporting working environment and the training efficacy. The mediation model supported these hypotheses though with some limitations.

Further, we discuss the practical implications of these findings and suggest directions for future research.

Keywords: online training, supportive working environment, engagement, interactivity

JEL Classification System: J24 (Human Capital; Skills; Occupational Choice; Labour Productivity) and Y4 (Dissertation).

Resumo

Atualmente a formação por via digital está a tornar-se crucial na vida dos empregados, este fenómeno já começou na última década, contudo, devido à atual situação pandémica, as empresas tiveram de melhorar e atualizar as suas ferramentas a fim de proporcionar uma formação eficiente mesmo durante o período de confinamento.

Este estudo transversal (N=200) visa identificar os elementos que, em cenários de formação por via digital ou telemática, podem ser aplicados para implementar a eficácia da formação. Levantamos a hipótese de que a interatividade, como característica da formação, estava positivamente relacionada com a eficácia da formação on line relativa a trabalho em equipa. Portanto, equacionámos que um ambiente de trabalho de apoio estava positivamente relacionado com a eficácia do processo de formação. Uma análise de regressão entre estas variáveis demonstrou a existência destas relações.

Além disso, colocamos a hipótese de que a variável compromisso estava a funcionar como mediador entre a interatividade e a eficácia da formação, mas também entre a variável de apoio no ambiente de trabalho e a eficácia da formação. O modelo de mediação apoiou estas hipóteses, embora com algumas limitações.

Além disso, discutimos as implicações práticas destes resultados e sugerimos orientações para futuras investigações.

Palavras-chave: formação online, ambiente de trabalho de apoio, compromisso, interatividade

JEL Classification System: J24 (Human Capital; Skills; Occupational Choice; Labour Productivity) and Y4 (Dissertation).

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1. Introduction

1.1. Research Questions

The focus of this research is to analyse and highlight the principal aspects which could influence, in a positive or negative way, the effectiveness of online teamwork training. This topic was chosen because if it is possible to understand and interpret those factors, then they can be leveraged and be applied to positively enhance such type of training, as well as substantially reduce or eliminate any elements that have a negative effect on the efficiency and efficacy of the e-learning process to improve the quality of online teamwork training.

Training is generally described as a systematic and planned effort to modify or develop knowledge, attitudes, abilities, and skills through learning experiences, to attain effective performance in an activity or a range of activities (Tabassi, A. A., Ramli, M., & Bakar, A. H. A., 2011). Indeed, training plays a strategic role inside corporate organizations to improve performance and deliver on a company's goals. Therefore, it needs effective ways and methods to increase the performance's level (Tabassi, A. A., Ramli, M., & Bakar, A. H. A., 2011). For this reason, it is important to find the factors which characterize an effective online teamwork training. Therefore, the field of training and development is directed towards individuals, and learning is its key method of inducing change (Rothwell et al., 1995). Training is a key element which can help Human Resources departments in driving organizational changes, improving the result, and it is a particularly crucial activity during a period of uncertainty and instability such as the current one because of the global pandemic which is modifying the way of working of many companies all around the world.

Due to the COVID-19, it has become not only particularly important but also necessary to implement online learning initiatives which involve distance learning through web-based content. In fact, during the last months, companies have been updating their training programs in order to allow the delivery of them despite the restriction to freedom of movement applied to contrast the spread of Covid-19, which have limited the ability for employees to attend in-person activities. Moreover, if designed properly, online learning systems can be used to determine learners' needs and current level of expertise, and to assign appropriate materials for learners to select from, to achieve the desired learning outcomes (Anderson, T. (Ed.), 2008). Online learning is a very useful method to serve several employees at the same time, to highlight their competency gaps that need to be filled and to assess their achievements to better plan their professional growth, through effective and exhaustive learning program.

This thesis will specifically focus on an analysis regarding the effectiveness of online teamwork training. Indeed, in modern corporations, teams are seen as adding a powerful dimension to the

workplace, combining the skills and creativity of a diverse number of people in order to produce an effective outcome (McGourtey & deMeuse, 2001). Harvey et al. (1997) stated that the highest level of workplace activity is one that uses transformative skills to facilitate innovative teamwork. Indeed, empowering teamwork is a fundamental factor in creating a company's success because of its strategic role in both individual and organizational performance (Hanaysha, J., 2016). While this has become increasingly challenging due to the current situation, it has also assumed an even more strategic role in keeping team cohesive and cooperative even though team members are working remotely from different "workplaces" and so communication can be harder and less dynamic than normal (Masaldzhiyska, S., 2020).

Moreover, it would be interesting to analyse the impact of these organizational changes on the level of employee engagement and understand if increasing it would be possible to enhance the effectiveness of training initiatives. Consultancy firms have conceptualized engagement by combining and relabelling existing notions, such as commitment, satisfaction, involvement, motivation, and extra role performance (Schaufeli, W. B., 2013).

Another factor that should be analysed is the role that the workplace is assuming nowadays, to discuss what a supporting environment means and how to recreate it and spread it in the current labour market, throughout the biggest possible number of companies. It can be assumed that a supportive working environment can be developed through an organizational change, where the climate that will be created can foster the growth of learners' communities and actively supports collaborative learning efforts (Greer, J. E., Mccalla, G., Collins, J. A., Kumar, V. S., Meagher, P., & Vassileva, J., 1998). Furthermore, the organizational culture and the atmosphere can play an important role in the delivering and in designing a training program because they may influence the way in which workers perceive the whole learning process.

1.2. Relevance

Currently, training has a very key role, and it is an element of differentiation among companies since it is an important part of the employee value proposition, but due to Covid-19 many organisations found themselves unable to provide in person training to their employees or realised that the remote training which they were providing was less effective compared to more traditional methods. There are several reasons for such inefficacy. For instance, employees could be less engaged because of the distance communication could be more difficult and less involving if trainers are not prepared in delivering this type of training, or another reason may be that recipients simply did not receive the right tools and input to confront and assimilate the learning process. The central focus of this research will be to understand and explain how to provide effective online teamwork training,

highlighting the role assumed by other factors such as engagement and environment. Will be study teamwork training, and not individual, because in a distance learning situation is important to analyse how to improve collaborations and teambuilding among colleagues, so the team performance, considering the limits derivatives by the remoteness.

Teamwork training has been chosen, as an element to study in this research, for its crucial role in the organizational strategy and performance. Wellins et al. (1994) presented case studies of how successful teamwork, in twenty of the world's largest companies, led to significant changes in productivity and innovation. Most companies now list attributes, such as “works effectively with the team” as a mandatory capability to become one of their members. In fact, improving teamwork is very important for better performance and more effective communication among company members. In fact, when people start collaborating to perform a task and think and discuss about it, a rich and inspiring worktable is generated, and when the basis of a work is inclusive and accurate, its productivity and improvement are more visible (Askari, G., Asghri, N., Gordji, M. E., Asgari, H., Filipe, J. A., & Azar, A., 2020).

Finally, due to the current situation, it is necessary to identify how to keep team members engaged and collaborative, training them to better communicate and to work in synergy even if they are physically far from each other. A new way of working is spreading, and employees must be ready to face this unprecedented change without compromising the level of their performance and instead use this opportunity to improve their output.

1.3. Goals

Since Covid-19 is a new element in our lives, scholars are still studying how it affects job performance. However, it is already possible to observe how companies modified and implemented the HR practices and their internal organization, to respect the new mobility restrictions imposed by governments. Redesigning the environment does not always turn out to be supportive or adequate to the workers’ needs, which are changing due to the current and unexpected situation. Moreover, a significant number of companies are allowing or imposing full remote work. Consequently, they are also giving online training which, for many organisations, is a new method which must be explored and improved. Indeed, the goal of this research study will be to verify the correlation between online teamwork training design and its effectiveness, considering also the key role played by the environment and the interactivity, while understanding how to engage employees during the whole training process.

2. Literature Review

2.1. Theoretical Framework

To achieve the goal mentioned above it is important to deeply analyse the theories related to training and learning to understand their evolution and predict their future developments, focusing on online teamwork learning. The aim of e-learning is to assure that new technology contributes effectively to develop workers' abilities and knowledge and to support their progression to keep companies economically competitive (Batalla-Busquets, J. M., & Martínez-Argüelles, M. J. 2014). While online learning has been increasingly adopted by organizations since its effectiveness and contribution to organization performance improvement has been proven, its diffusion is still limited as claimed by some scholars.

Owing to increasingly rapid technological advances, computer-supported collaboration has become commonplace. The irresistible benefits of online communication have led to the widespread adoption of electronic communication tools throughout the world of work (Thompson, L. F., & Coovert, M. D. 2003). Moreover, online teamwork training is becoming essential in companies in order to help employees to communicate and collaborate using new technological tools and methods to always increase velocity and level of performance, even more during this period where workers have to adapt their jobs in a remote version. Several studies established and provided evidence that organizational success depends also upon the interdependence recognized within teams and how vital and strategic it is for team members to understand their roles and work to achieve, not only individual, but also corporate goals, thus having a positive influence on organizational performance (Askari, G., Asghri, N., Gordji, M. E., Asgari, H., Filipe, J. A., & Azar, A., 2020).

One important aspect we discuss is that many companies, particularly small and medium sized ones (SMEs), are not ready from an organisational, technical, and human resources point of view to implement and use online learning, particularly E-learning (Hamburg, I., Terstriep, J., & Engert, S. 2011). Therefore, even if the benefits of e-learning are confirmed, some companies are still not prepared to implement new technologies in order to adapt and provide new training for their employees, because due to the pandemic, the urgent need to shift to distance learning showed the lack of adequate infrastructure. Therefore, in many countries, there were different challenges from the supply of electricity, to precarious online connectivity, low bandwidth, the lack to provide appropriate platforms and tools and finally the low level of digital skills (Chun, H. K., Comyn, P., & Moreno da Fonseca, P., 2021). However, organizations are now facing the need to have engaged and skilled workers, able to deal with changes and new challenges.

While remote working may not be feasible across all industries, the ones that are able to apply a work-from-home policy are faced with challenges to ensure their employees stay engaged, motivated, and productive during these lock down times (Dutta K. 2020). Because of the pandemic, several issues are emerging; in fact, trainers have been forced to redesign trainings so that they can be delivered remotely. Working, like training, from home could lead employees to experience loneliness and a sense of alienation due to the "distance" between colleagues and from the workplace. In fact, the isolation that results from physical distance seems to be a huge barrier to cultivating meaningful and rewarding relationships. It is not uncommon to encounter feelings of frustration in the absence of the social cues that occur in a face-to-face environment which could bring to mental health related problems. This has an impact on motivation, trust, reciprocity, and ultimately job satisfaction with many remote employees (Ian, V., 2011). On the other hand, this research will try to find out whether the engagement of employees could have a mediator role between a supportive environment and an effective online teamwork training.

Furthermore, it is the human capital, who either makes the business successful or leads it to failure, so it is the responsibility of the organization that they should equip their employees with updated knowledge and skills for achieving goal of the organization because each human being has potential capability but with time moving rapidly in a changing environment, their skills and knowledge become obsolete (Rafiq, M., 2015). For this reason, human re-skilling became an important driver to helping the organization and employee towards a professional growth. In today's world the biggest driver is digitalization, automation, and Artificial Intelligence, so lifelong learning is essential to stay updated with these new required skills (Sasmita, N., & Kumar, R. H., 2018).

This study will keep into account the role played by the environment in the training process, to verify which type of influence it can have. In particular, work environment can condition the relationship between colleagues, with the supervisor and the organisation. So, it describes the neighbouring circumstances in which employees are working together, beyond the physical elements such furniture, lights and more (Jain, R., & Kaur, S., 2014). The term *supportive environment* may refer to both the physical and the social aspects of the surroundings. The physical work environment is crucial to employee performance, satisfaction, social relationships, and consequently health. It should not only be understood as a physical structure (size, furniture, hallways, etc.), but also as a symbolic artifact (the meaning or image of the workplace), but also as an important source of stimuli. An example of artefact may be to provide healthy food such as fruit or sugar free snacks (Badayai, A. R. A., 2012).

With the current implementation and spread of remote work it is not always possible to recreate a healthy and stimulating environment at home and to provide the right tools to employees might also turn out to be complicated or not easily achievable, on the other hand some companies have given employees a subsidy to pay for furniture to recreate a friendly work environment at home and some others have incentivized employees to take it from the office and use it at home for the time of the mandatory curfew.

In a supportive work environment (SWE), employees feel supported and encouraged. In this sense, the work environment factor includes supervisory support, organizational support, and peer support. Organizational support theory and social support theory propagate on how “organizational support” builds affective commitment among employees and strengthens their emotional connection with the organization (Kundu, S. C., & Lata, K. 2017). The social aspect relates to the environment and is negatively influenced by movement restrictions and social distancing. Relationships between colleagues have significantly changed over last months. Furthermore, employees could feel lonelier and less engaged because of the lack of in person relationships which normally help people to feel as part of the same social group, increasing their commitment.

To sustain the importance of human relationships, in this case at the workplace, there are theories about the hormone oxytocin. In the brain, oxytocin acts as a chemical messenger and has an important role in many human behaviours including sexual arousal, recognition, trust, romantic attachment, and mother–infant bonding. There are several published studies investigating the prosocial effects of oxytocin in humans: behaviours that facilitate interpersonal relations, including trusting behaviour, generosity and cooperation, attachment, and social-emotional responses such as envy and social aversion; as well as various other variables that facilitate interpersonal connection (Churchland, P. S., & Winkielman, P., 2012). Indeed, in person relationships have a crucial role in stimulating this hormone to help in building stronger connections between colleagues.

2.2. Online Training

Virtual education generally refers to instruction in a learning environment where trainers and trainees are separated by time or space, or both. The course contents are conveyed through IT applications, multimedia resources, the Internet, videoconferencing (Dung, D. T. H., 2020). The Report of the Commission on Technology and Adult Learning (2001) defined e-learning as the instructional content or learning experiences delivered or enabled by technology. The report focused on how e-learning impacted adults. It refers to technology-enabled learning designed to increase workers' knowledge and skills so that they can be more productive, find and keep high-quality jobs, advance in

their careers, and have a positive impact on the success of their employees, their families, and their communities (Bonk, C. J. 2002).

Despite the advantages stated above, some organizations have been admittedly slow to adopt and apply the necessary tools for their training needs. Part of the reason for their hesitation was the variability in companies of system features, product support, functionality, infrastructure requirements, and sometimes the lack of budget to provide them to workers (Bonk, C. J. 2002). However, without any other choice, due to the pandemic, many companies had to adapt their learning systems to an online version, although this change has been extremely demanding in some cases, because of the inadequacy of the existing tools.

Despite growing evidence of the benefits of online learning, there continues to be disagreement about whether work education should be offered online. In fact, opponents argue that professional identities, practical skills, interpersonal relationships, and connection between trainers and recipients may not develop in an online environment. Others have suggested that the distance that exists between participants in online training could lead to miscommunications, isolation, and emotional distance (Afrouz, R., & Crisp, B. R., 2021).

Technology is changing how we learn, since decades already. Hypermedia technologies, specifically the Internet, are creating a paradigm shift in communication and learning (Dillon and Gabbard, 1998). It has been viewed as a social revolution. In fact, online learning brings many objective advantages such as the flexibility of time and place and it is also easier to assess and report progress or failures of participants, acting quickly on deviations and/or gaps. Therefore, with asynchronous courses, the recipients of the training can enjoy a more flexible schedule that conveniently fits their available time and location. Indeed, virtual learning is a dynamic alternative for self-motivated workers who can constantly stay on task and monitor their learning goals (Dung, D. T. H., 2020). Through the Internet, space and time are altered with the entire world shrinking to a virtualized intermingled space and actions and events shared in real time (Ravet and Layte, 1997). Moreover, the web makes it possible to provide and receive training from different parts of the globe, which has been necessary in many situations due to the pandemic, so employees who were used to traveling to work had to find different solutions to do their job.

One of the most effective online learning practices is Virtual Learning (VLE) which uses the computer and an online program or software to enhance the learning experience. The difference between eLearning and virtual learning is the amount of interaction involved. Virtual learning has more interaction between recipients and trainers, receiving this type of training, being a complete learning experience, where it is possible to find different environments, while eLearning is more self-paced.

The use of VLEs within each context implies the acknowledgment of their main features and potentialities. Learning environments and contexts are dynamic and multidimensional concepts which emerge from the new educational conceptions and practices in the digital society (Alves, P., Miranda, L., & Morais, C. (2017). Moreover, VLE provides an environment based on the network, and the resources in the network are free to share. Therefore, the study process can enhance the collaboration among learners. The VLE can help learners do cooperative study and make necessary interactions between each other (Pan, Z., Cheok, A. D., Yang, H., Zhu, J., & Shi, J. 2006). Online learning can be designed in order to involve the participation of the recipients who would in turn be more committed as active learners and not passive as it usually happens with more traditional training methods.

2.2.1. Interactivity

There are many definitions of interactivity, applied to training, in the literature and there are two main elements shared: information exchange and participation. Information exchange is simply sharing information between others. Participation is the extent to which senders and receivers are actively engaged in the interaction as opposed to giving monologues, passively observing, or lurking (Burgoon et al., 2000). The element which characterizes interactivity the most is the human factor, the interaction flow between providers and recipients of the training program, which makes the process more dynamic and engaging when every participant assumes an active role.

A survey that was conducted by Lee et al showed that most students preferred the usage of videos, online courses, games, simulation software and audio recording, and they expected to have more interactive forms of digital learning, simulation software and videos regarding the topics to be learnt before and during COVID-19 (Sözmen, E. Y., Karaca, O., & Batı, A. H., 2021). This could have contributed toward attracting students' attention and boosted their motivation for completing various training tasks. Implementing interactive, cooperative, and individualized activities which are centered on discussion, debate, and brainstorming (Gheith, E., & Aljaberi, N. M., 2017).

A perfect example of interactivity in training is represented by the gamification method which can be defined as the application of game features, mainly video game elements, into other contexts for the purpose of promoting motivation and engagement in learning process through more interactive and dynamics elements (Alsawaier, R. S., 2018). Therefore, it refers to the application of systems, services, organizations, and activities in learning's design, to recreate similar experiences, motivations, and skills as in video games (Rapp, A., Hopfgartner, F., Hamari, J., Linehan, C., & Cena, F., 2019).

Interactive learning is a necessary and fundamental mechanism in increasing knowledge acquisition and in boosting the development of both cognitive and physical skills. Before designing interactive learning resources, it is important to understand how interactivity works and the nature of

the environments that are required in order to support it (De Jong, T., & Sarti, L. (Eds.), 1994). Interactivity is a strategic aspect of online learning programs because it allows and enables an active participation of trainees and trainers, so it is a factor which makes interaction easier and more interesting. Therefore, it should be implemented through a supportive and predisposed environment which fosters a greater development of the employees' skills.

Undoubtedly, computers currently offer one of the most exciting and potentially useful mechanisms for the development and delivery of software to support knowledge and skill transfer (De Jong, T., & Sarti, L. (Eds.), 1994). The level of interactivity of the software can make the difference in terms of efficacy and efficiency of the training delivered. Interactivity is useful in order to facilitate communication and to improve the result of the training process, also because it allows immediate feedback. Comparing with other education medias, one of the best advantages of networks teaching is that it is very easy to realize the conversation and cooperation between trainers and recipients of the learning program by real-time or non-real-time interactive ways (Yuan, N. H., Xue, Y. X., & Gao, A., 2007). Moreover, interactivity is a necessary feature to simplify any type of collaboration and communication between attendees, taking advantage of the flexibility of time and space, to achieve goals in an easier way than with "passive" training, where there is no possibility of clarifying doubts or asking questions in real time.

Furthermore, structural components of active support, a person-centred approach to providing direct support, reside in the paper-based systems for planning and monitoring. They set the occasion for staff-client interaction around participation in a constructive activity (Toogood, S. 2008). The active support is an indispensable element of an online training to continuously help employees who are receiving it and thus drive them towards a better understanding and absorption of the training content.

Finally, considering the information presented, we hypothesize:

H1: Interactivity in online training is positively related to the effectiveness of online training.

2.2.2. Teamwork Training

A recent survey of graduates from a variety of Australian universities found that the ability to contribute positively to team-based projects was the skill most prized in the workplace (Scott & Yates, 2002). Furthermore, organizations increasingly require "works effectively with the team" as a mandatory capability for their members, for this reason many companies provide training about teamwork periodically in order to improve performance, both individual and organizational.

Organizations have reported several benefits derived from the use of teamwork. These include increased individual performance, better quality, less absenteeism, reduced employee turnover, leaner plant structures, and substantial improvements in production cycle time. In general, teams are considered an important ingredient of organizational success in the modern economy that is characterized by a need for rapid information exchange and response to customer demands (Bishop, J. W., Scott, K. D., & Burroughs, S. M., 2000). In fact, teamwork dynamics is one of the topics most studied in people development and leadership programs.

Nonetheless, applying team-work principles on the job remains challenging. Indeed, it involves breaking old habits of communication and interaction, among workers, much of which we do under time pressure and without much conscious deliberation. While behavioural and knowledge competencies are critical for effective teamwork, attitudinal competencies matter as well. These include belief in the importance of teamwork, mutual trust, and comfort with taking inter-personal risks. These characteristics are tied to organisational climates and cultures, which are heavily influenced by leadership at all levels. General teamwork training combined with specific communication tools is an effective strategy, as the training provides a broad rationale for team-work and general competencies while the tools provide scaffolding, support, and reminders for using teamwork skills on the job (Salas, E., & Rosen, M. A., 2013).

Team reflexivity, the extent to which teams collectively reflect upon and adapt their working methods and functioning, has been shown to be an important predictor of team quality outcomes, notably innovation (Schippers, M. C., West, M. A., & Dawson, J. F. 2015). Team reflexivity is defined as the extent to which group members overtly reflect upon and communicate about the group's objectives, strategies (e.g., decision making), and processes and make changes accordingly (West, 2000). Team reflexivity can be seen because of a teamwork training process, thanks to it, people learn how to collaborate and to synchronize their activities within the team. A small but growing body of research suggests that team reflexivity—that is, conscious reflection on team functioning—may be an important process in enhancing team innovation, the development and implementation of more effective processes or procedures (for a review, see Widmer, Schippers, & West, 2009).

2.2.3. Training Programs for effective teamwork

Team building has at its core the central notion that enlisting the participation of a group in planning and implementing change will be more effective than simply imposing change on the group from someone who is not a member. The process by which the members of the team become able to effectively participate in the targeted change requires that the team acquire new skills and perceptions (Salas, E., Rozell, D., Mullen, B., & Driskell, J. E., 1999). It is widely used and comes in many forms,

including outdoor experiential activities and indoor group process discussions (Klein, C., Diaz Granados, D., Salas, E., Le, H., Burke, C. S., Lyons, R., & Goodwin, G. F., 2009). Team Building is one of the most used and effective teamwork training and involves every member of the team in activities and workshops where the scope is to improve performance and cooperation within the team. For our purposes, we define team building as a class of formal and informal team-level interventions that focus on improving social relations and clarifying roles as well as solving task and interpersonal problems that affect team functioning (Klein, C., Diaz Granados, D., Salas, E., Le, H., Burke, C. S., Lyons, R., & Goodwin, G. F., 2009). The scope of this type of training is not only to improve skills but also to make clear functions and relations inside the group.

Therefore, an effective teamwork training program should also include group communication as a skill to improve, since it is very important that inside a group there is a clear and fluent transmission of information in order to not misunderstand or lose some concepts. Team communication is dependent on the communication acts of team members and the ability of managers to facilitate, stimulate and motivate them. Team members from organizations using different information systems tend to have different understanding, opinions, and rates of adoption and skills levels regarding specific IT tools (Den Otter, A., & Emmitt, S., 2007).

Nowadays it is becoming increasingly necessary to implement and enable virtual communication, which happens through the internet with the support of different kinds of devices. In most cases, team members receive little or no training to improve the effectiveness of this form of communication. When training is used, it often focuses on software utilization skills, not on interpersonal communication dynamics (Warkentin, M., & Beranek, P. M., 1999). These computer-based communication technologies are utilized to overcome space and time constraints that burden face-to-face meetings, to increase the range and depth of information access and to improve group task performance effectiveness, especially by overcoming 'process losses' (Straus, S. G., & McGrath, J. E., 1994).

2.3. Supportive Work Environment

Supportive Work Environment (SWE) is essential for organizations to sustain the viable growth and performance (Luthans *et al.*, 2008). Introducing a contextualized perspective of the SWE in the form of perceived climate, supervisory relationship, peer group interaction and perceived organizational support (Kundu, S. C., & Lata, K., 2017). In fact, the term supportive refers to a work environment which helps to create a productive organization and to increase employee well-being, through the right organizational culture and suitable HR practices.

Based on previous strategic human resources management literature, we argue high-involvement HR practices consist of different bundles of HR practices that are oriented towards influencing employee skills and abilities, employee motivation and opportunity allowing employees to contribute. These bundles represent different HR policy domains, and they all are associated with positive employee performance by shaping supportive work environments that enhance employees' collective role behaviours at work (Prieto, I. M., & Pérez-Santana, M. P., 2014). Organizational work environment stimulates HR practices and employee behaviour that is directly linked to employee reinforcement. Management support and co-worker support are vital elements of predicting SWE. Based on previous findings, SWE is examined in terms of the perceived climate, supervisory relationship, peer group interaction and perceived organizational support (Kundu, S. C., & Lata, K., 2017). In fact, a Supporting Working Environment strongly depends on the organizational culture, so on the beliefs and values shared from the top to the bottom of a company, as the ways and the types of interactions between team members.

Moreover, many researchers have already examined the effects of such conditions on individuals' innovative behaviour, and most of their studies suggest that the perception of supportive and encouraging climates at work can enhance the innovative responses of employees and, moreover, the accommodation of those responses to the organization (Prieto, I. M., & Pérez-Santana, M. P., 2014). A supporting work environment is a flexible organisation where employees are supported and motivated by their supervisors, not only to complete their tasks, but also to bring newness and improvements in order to achieve key objectives.

Social actors are essential in the perception of supportive work environments. In fact, studies have shown that individuals show more positive affective responses (e.g. satisfaction and affective commitment) when their supervisors (i.e. line managers) and co-workers treat them in a warm and supportive fashion, whereas other studies suggest that the absence of support produces feelings of anger and frustration towards the organization (Madjar, N., 2005). The perception that employees have regarding the working environment affects their feelings and consequently their behaviours and performance. Thus, we could infer that a positive climate will also influence the learning process in a constructive way.

Therefore, when line managers are supportive they show concern for employees' feelings, provide non-judgmental, informational feedback about their work, and encourage them to voice their own concerns (Shalley *et al.*, 2004). It is then important that during and after workers receive training, feedback is shared about their learning and their work, in order to have an exchange of information and clarify possible doubts or questions, maximising the impact of the training. In fact, an employee's

relationship with his or her supervisor represents an important aspect of the work environment that influences the employee's intention to perform, and thus initiative for problem solving, improve the speed of response, and the quality of work (Shrivastava *et al.*, 2006).

2.3.1. Learning Transfer System Inventory

Starting with the scholar Desse (1958), the field of learning psychology has emphasized the relevance of transfer of learning. Practically all educational and training programs are built on the premise that human beings could transfer what they have learnt from one situation to another. Moreover, the research has demonstrated that learning transfer is complex and involves multiple factors and influences (Chatterjee, A., Pereira, A., & Sarkar, B., 2018). Moreover, to have a more detailed evaluation and description of the environment is important to classify all the factors needed to understand the type of workplace and their learning programs.

The Learning Transfer System Inventory (LTSI) is a model essentially developed based on a questionnaire that is designed to deeply investigate the system of variables that affected the learning transfer process. The purpose of the LTSI is to assess all the factors that influence learning transfer from the training event to the workplace. Therefore, the LTSI was the first empirically tested instrument that showed the validity of all factors that affect learning transfer. In fact, it helps practitioners understand the various processes that occur around training processes and shows how they interact with each other, how they are independent and how their influence on learning transfer can be modelled.

According to several research, regarding LTSI there is increasing evidence that transfer of learning can be enhanced by interventions. In today's knowledge economy, transfer of learning is necessary to build and implement intellectual capital in organizations, for this reason it is important that measurement tools such as the LTSI must move out of the research domain into practical use and that interventions be developed to respond to problems identified (Holton III, E. F., Bates, R. A., & Ruona, W. E., 2000). Indeed, study findings suggest that an innovative and supportive department or subculture is the greatest environmental influence on employee application of learning and localized leaders have a major opportunity for influencing the related motivation of their direct reports and followers (Egan, T. M., 2008).

The results suggested that together with the organisation's leadership, there are several distinguishing characteristics of a learning environment. These include learning with colleagues, openness to new ideas and change, building relationships, open communication, sharing the learning, coaching and reflection (Lancaster, S., & Di Milia, L., 2015). Therefore, as claimed in the LSTI

(Chatterjee, A., Pereira, A., & Sarkar, B., 2018) learning outcomes are a function of ability, motivation, and environmental influences. For this reason, the factors which analyse the degree of supportiveness are feedback, supervisors support, peer support, resistance, and openness to change, finally personal outcomes (positive or negative).

2.3.2. Need Assessment and the training plan

Training needs analysis is a function recognized as an integral part of any well-designed training program by training theorists and academics. Its logic is simple. To make the most effective use of training tools and resources, one must first determine exactly where, how much, and how great the need for training is (Moore, M. L., & Dutton, P., 1978). In fact, the authors suggest examining the state of organizations and employees to design the learning experience that best fits the business context, for example, through a skills gap analysis between the current and desired state of each element that is part of the organization.

Training needs assessment (diagnostic) is an ongoing process of gathering data to determine what training needs exist so that training can be developed to help the organization accomplish its objectives. Conducting needs assessment is fundamental to the success of a training program. Often, organizations will develop and implement training without first conducting a needs analysis. These organizations run the risk of overdoing training, doing too little training, or missing the point completely (Brown, J., 2002). The effectiveness of needs assessment, which has a key role in the training process, is demonstrated by many scholars. It has been shown that a lack of analysis of the organization's requirements could result in a weak learning program, not adequate to the company situation, missing the opportunity to tackle priority gaps that will negatively impact the organization by missing the alignment with the business goals.

Therefore, the prerequisite to any training investment should be the completion of a Training Needs Analysis (TNA); without it a valuable budget may be wasted on coaching and guidance that is unnecessary, and which ultimately doesn't deliver a return on investment through the delivery of a positive impact on the bottom line (Denby, S., 2010).

Training can be an extremely powerful and cost-effective investment capable of transforming an organization, but only if it is implemented to match and complement the business's needs and objectives. It can help to expand the scope of available skills within the workforce as well as improve on existing expertise, all with the goal of improving the business's efficiency and effectiveness. And enhancing the capabilities of the team can even support retention, as staff feel empowered and invested in, and better equipped to deal with their daily activities (Denby, S., 2010). Furthermore, a deep and complete analysis of the organization has different goals such as to identify the main

problems of each area and to obtain the management support involving the departments. The assessment will also allow us to develop data useful for later evaluation. Finally, it will be possible to determine costs and benefits of the training previously implemented.

Furthermore, upskilling and reskilling are good and necessary practices in order to empower the workforce available and to adapt it to eventual organizational changes to implement the employees' value and, as a consequence, to increase the organizational benefit. Indeed, reskilling is to learn entirely new skills sets that will lead to new career positions while Upskilling is to learn new skills that will support to improve your current position. The coronavirus pandemic has made this question more urgent. Workers across industries must figure out how they can adapt to rapidly changing conditions, and companies must learn how to match those workers to new roles and activities. Developing this muscle will also strengthen companies for future disruptions (Agrawal, S., De Smet, A., Lacroix, S., & Reich, A., 2020). Also upskilling is an important instrument of adaptation to new possible scenarios caused by the pandemic, because it represents an opportunity for workers to update their abilities and their knowledge to performing higher.

After the above, we can state that identifying training needs for a company's employees requires an examination of mission objectives, personnel, production, raw materials, costs, and other factors. The identified training needs become part of an organization's total planned training budget and their implementation impacts the amount of funds that are allocated by senior management (Brown, J., 2002). Evaluation of the outcome given by the training process should assess training needs on three different levels: organizational, task, and individual.

The collection of data to assess training needs can be done through different tools such as surveys/questionnaires, interviews, performance appraisals, observations, tests, assessment centres, focus groups, document reviews and advisory committees. Finally, the trainer will only be successful and perceived as such to the extent that needs are carefully assessed, and programs developed and carried out that meet those needs. The result is a more precise picture of training needs, which can lead to a performance improvement-oriented training program and better results from training (Brown, J., 2002). Moreover, it increases employees' motivation when they get training on what they identify as an area for improvement.

Evaluating what has been analysed, we hypothesize:

H2: A supportive environment is positively related to the effectiveness of online training.

2.4. Engagement

Currently, due to the global Covid-19 pandemic, one of the main challenges for Human Resources managers is to keep both the engagement and the motivation of employees high and consistent, especially during a general lockdown. However, it is not always easy to find innovative and effective means to increase the commitment with people working remotely from home, where they have several distractions at hand.

In addition, different definitions of worker engagement can be found in the literature, but in all of them there are some common points that we will highlight below. In fact, this led us to define employee's engagement as a multidimensional construct that comprises all the different facets of the attitudes and behaviours of workers towards the organization. The five dimensions of employee engagement are: employee satisfaction, employee identification, employee commitment, employee loyalty and employee performance (Kumar, V., & Pansari, A., 2015). Consequently, to clearly measure and truly understand the level of employee's engagement it is necessary to evaluate these dimensions separately.

Previous studies have shown that employee satisfaction and commitment are related to significant business performance to a degree that is important to many organizations and that these correlations can be generalized across companies (Harter, J. K., Schmidt, F. L., & Hayes, T. L., 2002). Thus, it is important to check the degree of commitment because it has been shown to be closely related to the level of performance. Furthermore, it is possible to talk about commitment as a mediator in the relationship between HR practices, and performance effectiveness, this aspect will be analysed in the next sections.

2.4.1. Engagement in Online Training

Online trainers and instructors still face the difficult dilemma of how to motivate employees to take and complete online courses given their hectic lifestyles as well as how to help employees transfer what they learn back to the workplace. To assist them in these efforts, trainers need effective assessment and evaluation techniques (Bonk, C. J. 2002). One of the main difficulties for trainers is to transmit and communicate everything they know about a topic, while at the same time engaging trainees, which can be particularly difficult when the target audience is composed of a diverse group of learners. The evaluation of each employee individually is a very useful tool to make them aware regarding their weakness and strengths.

Moreover, in a review of empirical literature on coaching (Hagen, 2012), the presence of managerial coaching creates positive outcomes, many of them significant. These positive outcomes include employee satisfaction and performance; organisational commitment; reductions in turnover

intention; performance improvement; enhanced project management outcomes; customer satisfaction; and increased sales performance (Ladyshevsky, R., & Taplin, R., 2018). A key goal of the most active and engaging online learning experiences is to apply the expertise and experience of different participants or learners to a problematic group situation that helps them achieve something they could not before (Bonk, C. J., 2002). In fact, one way to engage is to personalize and have a true knowledge exchange, where both trainers and trainees interact by giving their opinion and sharing their experience. As discussed earlier, the human factor can make a significant difference during the learning process.

As it was mentioned before, gamification plays an important role in online training, in order to enhance the learners' engagement. This happens because the game helps people get engagement from the feedback of small achievements, which in turn motivates them to continue, whereas a training expected to reach the results needs to have the participants engaged to achieve the final purpose. Game elements can be referred to as well-designed rules, scoring, challenges, collaboration, puzzles, role-playing, among other factors related to motivation, interaction, and reward mechanics (Santos, S. A., Trevisan, L. N., Veloso, E. F. R., & Treff, M. A., 2021).

In view of what has been highlight we hypothesized:

H3: Engagement has a mediator role between interactivity and effectiveness of training.

2.4.2. Engagement in a SWE

These days, talk of a supportive environment can refer to both the virtual and physical workplace. In the former case, technologies and their use have a huge impact on the effectiveness of communications that could have a heavy impact on production. In fact, the biggest challenge to communication in the virtual workplace is bridging the distance between team members (Hirsch, A. S., 2019). In addition, the virtual workplace of technology educators requires the skilful use and management of technology and services to create online classrooms, related professional activities, and continuing professional development programs. These skills include digital word processing, simulation, online instructional delivery, internet research, and basic computer operating skills. (Onwusuru, M. I., & Ogwo, B. A., 2019). The physical workplace is clearly related to material aspects such as furniture, lighting, ventilation, temperature, but also to relationships with colleagues and the type of communication used in interactions (Hamidi, N. N. E., Mansor, F. A., Hashim, M. Z., Muhammad, N., & Azib, W. N. H. W., 2020).

Organizational support theory and social support theory propagate on how "organizational support" builds affective commitment among employees and strengthens their emotional connection with the organization (Rhoades *et al.*, 2001). Further, it serves as a valuable input for desired behaviour

among employees and therefore, develops innovative work behaviour as well (Prieto, I. M., & Pérez-Santana, M. P., 2014). Previous studies have revealed that SWE results in higher organizational commitment (Rhoades *et al.*, 2001) and improved employee retention (Eisenberger *et al.*, 2002). Organizations create supportive learning environments through the influence of organizational culture and leadership (Lancaster, S., & Di Milia, L., 2015). They use the term perceived organizational support (POS) to describe the extent to which employees believe that the organization values their contribution and cares about their well-being (Eisenberger *et al.*, 1986).

Improvement in student support, allows to personalise interaction and to increase each student's participation and progression in the whole training process (Batalla-Busquets, J. M., & Martínez-Argüelles, M. J., 2014). According to Magazine, F. (2000) if you just throw a training program at recipients, with no support, only 10 percent complete it. But if you give them technical support, online assistance, coaching, or mentoring, and an environment where they can concentrate, then that makes all the difference. Indeed, in a SWE delivering a training program means providing it accompanied by the right tools and a powerful assistance to be more meaningful and addressing the recipient in a proper way.

Some authors have shown that there is no doubt that engaged employees work better, aspire higher and achieve more, but you can't create employee engagement without first designing employee experiences. In fact, it's time to rethink strategy and implement a real-world framework that focuses on creating an organization where people want to show up to work.

Considering what emerged we hypothesized:

H4: Engagement plays as a mediating role between supporting working environment and effectiveness of training.

2.5. Effectiveness of online training (Teamwork assessment)

A training program is considered effective when it produces the acquisition of knowledge and skills or the change of attitudes or behaviour which are considered appropriate for employees to perform their jobs in the manner that has been defined by the organizational plan (Castro, I. D., 1993). Training interventions are evaluated for effectiveness, efficiency, and acceptability to staff (Parsons, M. B., Reid, D. H., & Green, C. W., 1996). With effectiveness of training scholars refer to a learning program which has demonstrable and measurable positive effects on individuals, as on organizational performance. Moreover, it is important to consider the perspective of workers who should be ready to learn and motivated to increase the effectiveness.

Furthermore, training effectiveness is dependent on events that occur before, during, and after the actual training, and is greatly influenced by individual's characteristics and other factors related to the work environment (Arthur Jr, W., Bennett Jr, W., Edens, P. S., & Bell, S. T., 2003). To evaluate effectiveness, it is necessary to consider different elements which may affect the success of the learning program. In fact, when evaluating training effectiveness, individual employee characteristics and the work environment must be considered along with program content, design, and implementation (Arthur Jr, W., Bennett Jr, W., Edens, P. S., & Bell, S. T., 2003). Researchers have clarified the impact of organizational context, course design, individual differences, and training interventions on training outcomes. Training effectiveness can be defined as the extent to which the training produced the intended outcomes. In general, training is effective when employees are satisfied with the training experience, increase their motivation, and improve their knowledge and skills (Sitzmann, T., & Weinhardt, J. M., 2018). This effectiveness should be judged on the adequacy of the program to bring about the change in work behavior that was deemed necessary and defined in the need assessment phase (Castro, I. D., 1993). In fact, the need assessment plays a key role throughout the learning process, useful in highlighting goals and objectives to be achieved.

Another important element is how trainees understand the process. Do staff perceive the training as a 'one and done' episode, or as a part of the organisation's true values? To realise long-term and sustained change, organisations must provide the supportive context for teamwork and pervasive reminders that teamwork matters to the organisation (Hackman, R. J., 2002). Hence, to increase the effectiveness of the training, about teamwork, organisations should transmit training as a continuous process strongly connected to the improvement of the company, promoting a supporting environment which might transmit training as a value and belief, of the organisation, to workers. However, training will not automatically provide the answer to all organizational or management problems - to be effective, it must be part of an appropriate solution to specific kinds of problems (Bedingham, K., 1997). Therefore, any training program should be designed thinking about the specific problems and issues emerged during the need assessment, but also considering the whole organizational asset.

Today, companies are facing great change due to the pandemic, so it is even more important to evaluate the effectiveness of new training programs, for organizations that have had to redesign their methods and processes. Thus, the need to evaluate the effectiveness of training is critical in this emerging decade of online workplace training (Long, L. K., DuBois, C. Z., & Faley, R. H., 2008). Fortunately, the same computer technology that makes online training possible also facilitates the collection of training evaluation data before, during, and after training. The easiest data to collect are learner reactions and learning (Long, L. K., DuBois, C. Z., & Faley, R. H., 2008). At the same time, this technology-based approach facilitates data collection and analysis.

2.5.1. Evaluation of Training Effectiveness

Over the last years many evaluation models have been developed, however, from 1959 the scholar Donald Kirkpatrick started to develop a revolutionary *Model of Evaluation*, which became the most popular one, devised to deeply analyse the impact of training programs, the model was then updated by the author in 1976 and 1996. According to D. Kirkpatrick there are three main reasons to evaluate training programs, first for improving the future learning program, secondly to identify the reason to continue or drop the training program and finally to justify the training budget and existence of the department in companies (Rafiq, M., 2015). Several scholars claimed that evaluation is needed to improve future programs and to eliminate those programs that are ineffective (Kirkpatrick, D. L., & Craig, R. L., 1970). A continuous evaluation followed by an updating of the training is necessary to always have a better result and consequently an improved performance. Moreover, organizations are incessantly changing, influenced also by the external environment, so it is important to continuously review HR practices and methods to keep them updated.

Training means equipping employees with new or traditional methods or techniques or modules to translate the information, knowledge, and skills to practice them in an organization to improve the overall effectiveness of the organization (Rafiq, M., 2015). Therefore, it is important to provide employees with all the necessary tools to cope with changes to stay competitive in the market. As mentioned earlier, the transfer of information through e-learning settings has become more important and companies are therefore experiencing a shift from traditional classroom training to e-learning. Indeed, statistics show that companies that continue to innovate in corporate eLearning settings are considered market leaders (Beinicke, A., & Kyndt, E., 2020). Due to the current situation caused by the pandemic, there is a need to adapt new learning technology systems and evaluate their effectiveness, compared to more traditional tools.

The four-level model of employee training evaluation aims to measure trainees' reaction to a particular training program, the learning that took place during the training, the behaviour influenced by the training, and the outcomes that occurred because of the training (Kirkpatrick, D., 1996). The model focuses on how the training program influences workers by analysing their views and behaviours. Evaluation is transformed from a complicated and elusive generality into clear and achievable goals if we break it down into logical steps.

These steps can be defined as follows:

Step 1 Reaction. How well did the conferees like the program?

Step 2 Learning. What principles, facts and techniques were learned?

Step 3 Behaviour. What changes in job behaviour resulted from the program?

Step 4 Results. What were the tangible results of the program in terms of reduced cost, improved quality, improved quantity, etc? (Kirkpatrick, D. L., & Craig, R. L., 1970). These are the main questions answered by each part of the model.

However, in this research the focus will be on learners' perceptions of the training program, as it will be interesting to analyse the effectiveness of the training from a different perspective, also considering the perception of the recipients and not only the results in terms of quantitative performance analysis. In fact, the results suggest that by considering the perspective of the actual recipients of the training, our understanding of the factors that influence the effectiveness of the training may be improved (Santos, A., & Stuart, M., 2003).

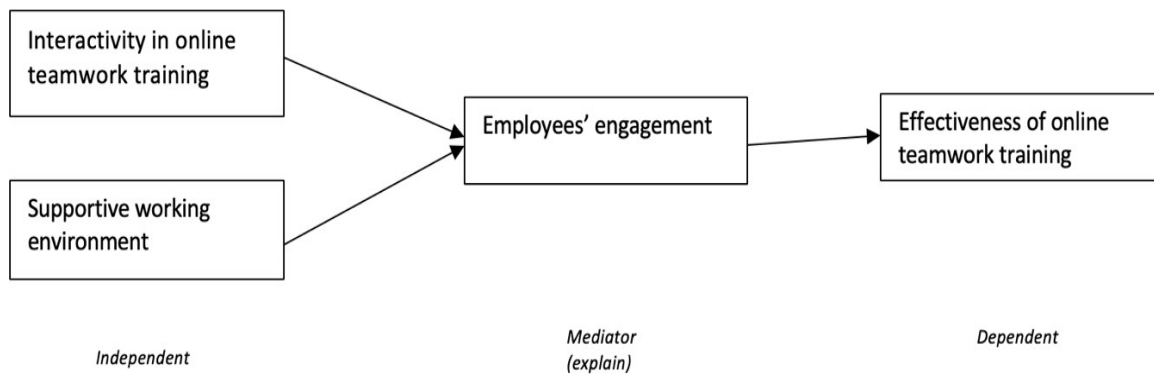
3. Methodology

The aim of this research project is to show a more complete description of online training, focused on teamwork, for this reason it is possible to say that it is a descriptive research whose objective is to highlight the relationships between the variables previously chosen and described.

In particular, the training programme will be analysed considering the current situation due to Covid-19, since it is a new factor that influences our working life and routines. Furthermore, the research method is a quantitative analysis, based on the possible influences caused by the variables (two dependent, one independent and one mediator), starting from a thorough literature review.

The study will follow the requirements of reliability and validity. The former describes to what extent a particular test, procedure, or instrument, such as a questionnaire, will produce similar results under different circumstances, assuming nothing else has changed. While validity refers to the closeness of what we believe we are measuring to what we intended to measure (Roberts, P., & Priest, H., 2006).

Figure 3.1 Graphic representation of Hypothesis



3.1. Sample

The sample of this research was selected through non-probabilistic convenience and self-selection. The study considered people working in organisations that are currently receiving or have just finished online training focused on teamwork. The questionnaire was sent to employees working in different sectors and countries to get a broader and a more global view regarding online training at the time of Covid-19, since is a phenomenon which is currently affecting everyone. In total, we collected 200 participants from 29 different countries.

Table 3.1 Demographical data

Variables	Answer	Frequency
Gender	Female Male Prefer not to say	70,5% 30% 0,5%
Age Groups	18-25 years old 26-35 years old 36-45 years old 46+ years old	57% 32% 6% 5%
Educational Level	Bachelor's Degree High School Master's Degree Ph.D. or higher	54% 17% 26% 3%
Home-office (Country)	Italy Netherlands	13% 7%

From the observation of the *table 3.1* is it possible to deduce that 70,5% who answered to the questionnaire were female so the 30% were male and only 0,5% preferred to not declare their gender.

Regarding the groups of age, it is important to highlight that the 57,5% of the recipients is composed of young workers who just started their professional career, so they do not have a comparison with more traditional training programs and are more capable to use technological instruments.

The most represented Country was Italy with 26 respondents, followed by Netherlands with 15 participants. In total were 29 countries, from all around the world, to join the study giving their important contribution.

3.2. Measures

In the following paragraphs we will explain how and why we selected the scales chosen to measure the variables of the research study. At the beginning of the questionnaire there are some social demographic questions such as gender, age, home office Country, and level of education attained. These questions are meant to better identify and to define the research sample and thus to evaluate the results related to it.

After the first section, related to demographic data, there are four further blocks of questions, each referring to a different element of the research, are established based on scales previously developed by the researchers, which we selected through the literature review. Therefore, below there is an explanation of each selected measure.

Interactivity. This variable was measured using a scale developed by Hill & Bartol (2016, Personnel Psychology) to evaluate effective use of technology for virtual communication and collaboration focused on team virtuality. The scale used consisted of three factors with 10 items. The first factor, communicating virtually using technology, had four items (e.g., “Uses technology effectively to communicate with team members”). The second and third factors had three items each: responsive virtual interactions (e.g., “Keeps team members informed of progress and issues”) and collaborating virtually across boundaries (e.g., “Is open to differences in ideas and approaches to the task among members of the team”). The scale was modified to evaluate the trainer and not the peers in order to calculate the level of interactivity used by him within the training program. All items were originally rated on a seven-point Likert scale which was adapted to a five-point scale, from 1=does not describe the trainer at all to 5=describes the trainer extremely well.

Supportive working environment. This variable was measured using the Learning transfer system inventory (Holton et. Al., 2000), after choosing the questions more suitable to this research study. Therefore, the sections selected were the ones describing the type of working environment and in total were sorted eight items. The first one is about the perception of the trainee about the peer support (e.g., “My colleagues will encourage me to use the skills I have learned in this training”), then regarding the supervisor support (e.g., “My supervisor is meeting me regularly to work on any problems I may encounter applying what I learned during the training”). After that there are questions about manager sanctions (e.g., “My supervisor will think I am being less effective when I use the techniques taught in this training”) to understand if trainees feel encouraged to use the new knowledge acquired. Moreover, there is perceived content validity (e.g., “The methods used in this training are very similar to those we usually practice on the job”) to measure the degree to which the training is related to the actual job of the trainee. Regarding the way of teaching there is transfer design (e.g., “The way the trainer taught the material made me feel more confident. I could apply it in my job”). Another important element is the opportunity to use (e.g., “I will get opportunities to use this training on my job”), to analyse the perceived level of utility about the program’s content. Furthermore, there is resistance to change (e.g., “People in my group are not willing to make an effort to change the way things are done”), because it is important to evaluate the influence of colleagues during the entire process. Finally, there are feedback and coaching (e.g., “People often make suggestions about how I can improve my job performance”) to check the importance given to the training and its absorption by trainees. It was asked to rank each item based on a Likert scale from 1=Never to 5=Always.

Work engagement. This variable was measured using a scale created in the article Job engagement: Antecedents and effects on job performance (Rich, B. L., Lepine, J. A., & Crawford, E. R.,

2010). The scale includes three items which incorporate different aspects of work engagement: physical, emotional, and cognitive and for each one was chosen three statements in state of six since there were some overlapping. With the first item the authors wanted to evaluate the devotion to the job in terms of the level of energy invested (e.g., "I exert my full effort to do my job"). The emotional aspect was meant to rate the engagement in terms of feelings and attitude towards the job (e.g., "I feel energetic at my job"). The last one is more focused on the degree of mental efforts used (e.g., "At work, my mind is focused on my job"). It was asked to rank each item on a Likert scale from 1=Strongly disagree to 5=Strongly agree.

Effectiveness of online teamwork training. This variable was measured using a scale that was created from an adaptation of Kirkpatrick's model (four levels of learning assessment) to a version of the e-learning programme (Hamtni, T. M., 2008). The elements chosen for assessment were interaction, learning and outcomes (from the trainee's perspective). Originally, they were open questions, but in this research, they were adapted to a Likert scale in order to proceed with a quantitative research and to better perform the analyses related to the other variables. The first one was chosen to assess the effectiveness of the web platform and other technological tools (e.g., "Did the technology support learning?"). After that there were the learning questions to understand if the trainee really learned what he/she was supposed to learn (e.g., "Did you learn the material you were supposed to learn after the e-learning module?"). Finally, the results questions to analyse the trainee's perceived effectiveness regarding the whole training process (e.g., were the skills taught easily transferable to a work context?). Each question was asked to be rated on a Likert scale from 1 = strongly disagree to 5 = strongly agree, to be able to perform a statistical analysis with the other variables.

3.3. Procedure

Following the criteria mentioned above, workers who were willing to participate responded anonymously to a questionnaire divided in different sections, based on selected scales measure, which were already validated by other scholars. The questionnaire was built with the purpose to deeply examine the relations between variables, considering the point of view of the trainees during and after the training process. Furthermore, the questionnaire was created with google forms and then uploaded on different social media web platforms such as LinkedIn, Facebook, and Instagram, achieving 200 respondents in about 8 weeks. The survey was created only in English, so people from all around the world were able to respond thus achieving a more applicable result, so not representative of only one Country.

The whole data collection process was conducted respecting and assuring the confidentiality and anonymity of the data provided by participants. Finally, results were analysed with IBM SPSS Statistics (Version 26).

First, a principal component analysis (PCA) was conducted to reduce the number of variables derived from the questionnaire, because there were some redundancies as it was clear that several variables measured the same construct. At the end of the PCA process, Cronbach's alpha (see tables below) was calculated for each new data item to check for consistency between variables, in order to create new artificial variables. In addition, the first new variable to be created was "Interactivity" created by combining all variables resulting from all questions in the first section of the questionnaire. Then, four different variables were identified: "Peer support", "Manager support", "Not supportive", "Content validity" and "Feedback", which represent all the elements of a supportive working environment. Finally, "Engagement" and "Effectiveness" emerged, unifying the answers from the last section of the questionnaire we developed.

Following the reliability statistics table regarding the new variables created:

Table 3.2 Interactivity

Cronbach's Alpha	N of Items
,802	5

Table 3.3 Peer support

Cronbach's Alpha	N of Items
,835	3

Table 3.4 Manager support

Cronbach's Alpha	N of Items
,883	3

Table 3.5 Not supportive

Cronbach's Alpha	N of Items
,891	6

Table 3.6 Content validity

Cronbach's Alpha	N of Items
,925	9

Table 3.7 Feedback

Cronbach's Alpha	N of Items
,898	3

Table 3.8 Engagement

Cronbach's Alpha	N of Items
,899	6

Table 3.9 Effectiveness

Cronbach's Alpha	N of Items
,901	4

4. Results

A regression analysis was performed in order to calculate the possible correlations between the variables we selected, then to test the hypotheses, we determined through a thorough and exhaustive literature review, which are as follows: H1. interactivity in online teamwork training is positively related to the effectiveness of the training program, then H2. a supportive environment is positively related to the effectiveness of online teamwork training, furthermore, engagement plays as a mediator role between interactivity and training effectiveness, finally, engagement plays as a mediator role between the supportive work environment and the effectiveness of online teamwork training. In the next paragraphs we will expose and explain the results we obtained by calculating the correlations and mediations between the variables.

Table 4.1 Results of regression analysis

		effectiveness	interactivity	peers support	manager support	training validity	feedback	engagement
effectiveness	r sig	1	,334** ,000	,259** ,000	,247** ,000	,274** ,000	,066 ,351	,174* ,014
interactivity	r sig	,334** ,000	1	,432** ,000	,507** ,000	,554** ,000	,157* ,026	,321** ,000
peers support	r sig	,259** ,000	,432** ,000	1	,548** ,000	,566** ,000	,157* ,026	,395** ,000
manager support	r sig	,247** ,000	,507** ,000	,548** ,000	1	,557** ,000	,339** ,000	,238** ,001
training validity	r sig	,274** ,000	,554** ,000	,566** ,000	,557** ,000	1	,278** ,000	,545** ,000
feedback	r sig	,066 ,351	,157* ,026	,157* ,026	,339** ,000	,278** ,000	1	-,004 ,951
engagement	r sig	,174* ,014	,321** ,000	,395* ,000*	,238** ,001	,545** ,000	-,004 ,951	1

** $p < .01$; * $p < .05$. r = Pearson correlation coefficient

Means, standard deviations and zero-order correlations for all the studied variables are shown in *table 4.1*. As we can see, effectiveness of online teamwork training was found to be positively associated with the variable interactivity, as a feature of online teamwork training, ($r = .334, p < .01$) and peer support ($r = .259, p < .01$), manager support ($r = .247, p < .01$) and content validity ($r = .274, p < .01$). Peer support, manager support and content validity are all elements included in a supportive working environment. Therefore, H1 and H2 were demonstrated.

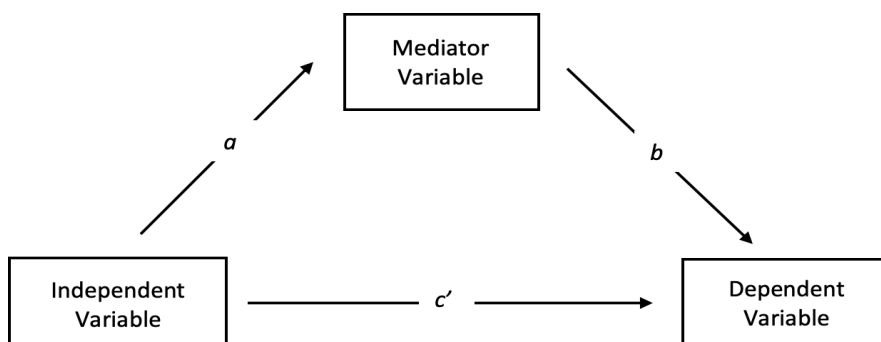
Table 4.2 Descriptive statistics of variables

Variables	Mean	Deviation std.
Effectiveness	4,0768	,64868
Interactivity	3,6665	,77130
Peer Support	3,7467	,79307
Manager Support	3,3800	,95519
Training Validity	3,5906	,72503
Feedback	2,9917	,92514
Engagement	3,9492	,72469

Looking at the data showed in *table 4.2* the standard deviation for each variable is <1 so it means that the values in the statistical data set are close to the mean (or average) of the data set. Indeed, the results for each section were similar, this could show a correlation between these variables.

Subsequently, a mediation analysis was performed to establish the influence and degree of influence of the commitment variable: firstly, between interactivity and training effectiveness and secondly, between supportive environment and training effectiveness. The term statistical mediation refers to a causal chain in which the effects of one or more independent variables are assumed to be transmitted to one or more dependent variables through third variables. A mediating variable is very useful in helping to understand the mechanism through which a cause (independent variable) produces an effect (dependent variable) (Pardo, A., & Román, M., 2013).

Figure 4.1 Mediation model



As is possible to see in *figure 4.1* it represents the association between X and M, so b indicates the relation between M and Y, finally c' shows the influence of X on Y. To run the mediation analysis the SPSS feature *PROCESS* was used.

According to Baron and Kenny (1986) In order to test the mediation model, it is important to verify the existence of three different conditions. First, it is necessary to test if the predictor affects the mediator, as it is the first condition for the establishment of a mediation. The following steps are to check whether the predictor affects the criterion variable and if the latter is affected by the mediator, which are the second and third conditions for having a mediation, respectively.

Following the tables with results will present two different types of effects (direct and indirect) for each group of variables analysed, and it will show the presence and level of eventual mediation process (see Annex A for more details).

Considering that direct effects are composed by $c' = c - ab$, while indirect effects by the following formula: $c - c' = ab$.

Therefore, in *table 4.3* by choosing interactivity as the independent (or predictor) variable, effectiveness as the dependent (or outcome) variable and commitment as the mediator, the following results were obtained:

Table 4.3 Interactivity and effectiveness of training

Effects of X on Y		t	p
Direct	,2607	4,3833	,0001
Indirect	,0202		

The values come from $a=,3021$ $b=,2607$ $c=,0667$ and t is different from zero, $p < .05$. Therefore, it demonstrated a positive influence of the predictor to the outcome variable through the mediator engagement. Indeed, the H3 is demonstrated.

In addition, the following elements were selected to represent the variable of supportive work environment: peer support, manager support and content validity. In fact, these three variables, among the elements that make up a supportive work environment, are those that proved to be most effective in influencing the outcome variable of training effectiveness.

First, in *table 4.4* we will analyse the results of peer support as independent variable (or predictor), effectiveness as dependent (or outcome variable) and engagement as mediator:

Table 4.4 Peer support and effectiveness of training

Effects of X on Y		t	p
Direct	,1844	3,0201	,0029
Indirect	,0275		

The values come from $a=,3611$ $b=,1844$ $c=,0762$. And t is different from zero and $p < .05$.

Moreover, in *table 4.5* manager support as independent variable (or predictor), effectiveness as dependent (or outcome variable) and engagement as mediator are shown:

Table 4.5 Manager support and effectiveness of training

Effects of X on Y		t	p
Direct	,1480	3,0894	,0023
Indirect	,0198		

The values come from $a=,1807$ $b=,1480$ $c=,1095$. Where t is different from zero, $p < .05$.

Finally, in *table 4.6* the results obtained by computing content validity as independent variable (or predictor), effectiveness as dependent (or outcome variable) and engagement as mediator are presented:

Table 4.6 Content validity and effectiveness of training

Effects of X on Y		t	p
Direct	,2276	3,1142	,0021
Indirect	,0173		

The values come from $a=,5449$ $b=,2276$ $c=,0318$. Last, t is different from zero and $p < .05$. Computing the results derived from the previous calculations where a supportive environment was used as an independent variable is clear that H4 is demonstrated.

However, the data analysis and the model present some limitations, as will be shown in the next chapters. When mediation exists, one expects the data to behave in a specific way. But the fact that the data behave in a specific way does not mean that mediation exists, there is always the possibility that the behaviour of the data is due to other reasons than mediation. Thus, even if in a mediation

study it is legitimate to conclude that empirical evidence compatible with the mediation hypothesis has been found, it is not legitimate to claim that the existence of mediation has been proven (Pardo, A., & Román, M., 2013). Thus, we can say that mediation has been proven in this research, but we cannot generalise our result by saying that what H3 and H4 say can be extended to every case where the same variables are used.

4.1. Discussion

The main objective of this dissertation was to analyse the type of correlation between the effectiveness of online teamwork training and other variables which may affect it. More specifically, we wanted to discover the role played by factors, such as interactivity and a supportive working environment, in the delivery of training, therefore how these elements have influenced the efficiency and efficacy of the training, according to the data gathered with the questionnaire which was somministrated to our sample.

Starting from the literature review we assumed that training and development programs are strategic in organizations, as they offer the opportunity to promote and consolidate technical and behavioural skills of employees, improving their performance at work (Martins, L. B., Zerbini, T., & Medina, F. J., 2019). Therefore, we wanted to testify the importance, not only of training, but more specifically of online teamwork training since its relevance inside the work society is constantly increasing. Thanks to our study we contributed to highlight the strategic role played by this type of training. Following the analysis of the results, considering also what we previously found during the literature review.

From several studies, emerged that engagement represents the desire to learn the training content, and it varies substantially across employees. This process also reduces training attrition and increases learning performance, enabling persistence, ultimately enhancing training effectiveness (Sitzmann, T., & Weinhardt, J. M., 2018). Analysing the data collected through the questionnaire we proved that a strong desire to learn increases commitment to learning goals, the amount of time spent in training, and training persistence, which are all components of self-regulated learning.

Furthermore, to help in filling a gap in literature we decided to start exploring the role of interactivity, so we discovered that several studies already partially demonstrated, the importance of this element in training. In fact, some researchers found that interactive training programs did impact the development of a set of non-cognitive skills, in particular empathy, growth mindset, and grit, or competencies as compared to the traditional training program (Gheith, E., & Aljaberi, N. M., 2017). Starting from our results we can say that a more interactive and practice training programs are

effective because they allow employees to learn through their own experience, this phenomenon is even more amplified in virtual training such as gamification.

Another variable we selected for our study is composed of the elements which characterizes a supportive working environment, because a collaborative climate with an open channel for communication with managers promote the positive job attitudes of people toward their organization and decrease intentions to turnover. This leads us to believe that a flexible, friendly, and supportive environment should be promoted to attract, retain, and encourage competent employees (Naz, S., Li, C., Nisar, Q. A., Khan, M. A. S., Ahmad, N., & Anwar, F., 2020). Indeed, a friendly and supportive environment seems to be a great place where to learn and grow professionally and personally. In addition, our findings support the idea that a positive disposition towards the tools may encourage work engagement. In other words, technology acceptance is a resource able to foster the motivational process, making workers more energetic, willing to invest effort in their activities and persistent in the face of problems or difficulties (Molino, M., Cortese, C. G., & Ghislieri, C., 2020).

Finally, we can assume that our four hypotheses are supported by the literature and they are also confirmed by our results, however it is important to consider the limited sample of our research, which we will explain in the limitations section.

4.2. Implications for practice

Starting from our results and discussion, we will present and explain some possible practical implications of our research study, which we would like to suggest to companies so that they can adopt these suggestions when designing training programmes.

Looking at our results we highlighted the power of interactivity in increasing the effectiveness of online teamwork training, therefore, one aspect that could be implemented in companies is the adoption of gamification in learning programmes. The term gamification refers to the use of game elements in non-game contexts and provides an engaging learning experience for a motivated and engaged learner in blended eLearning. The application of game-thinking facilitates student motivation and engagement towards eLearning (Jayalath, J., & Esichaikul, V., 2020). It is a new concept of online learning design which is spreading very fast due to the continuous technological development, and because many companies were forced to implement new online training programs due to the pandemic.

Furthermore, before planning a learning process, it would be strategic to recreate a favourable working environment in terms of manager and peer support but also, more generally, a positive climate regarding the type of relationships between colleagues. To learn it is necessary to have a friendly environment where it is easy to exchange feedback and opinions in order to grow. To create

a positive environment companies should help employees feel comfortable, for example by asking them what they need to work well and hard, then gathering their ideas to let them know that their feelings and opinions count and that the company will always support their requests. This will also improve communication, i.e., the exchange of information and the way of working cooperatively. Indeed, literature has long recommended providing support to trainees before, during and after training to promote transfer and maximise the organisation's return on its investment. Care should be taken to ensure that peers and immediate supervisors help trainees to put skills into practice (Martin, H. J., 2010). Creating a supportive environment is the first step to having a successful training programme, so establish a clear and constructive dialogue to build a climate conducive to working and learning together with the rest of the team.

These aspects, both interactivity and a supportive working environment, are linked to engagement, as we have shown through our data analysis. Therefore, another aspect to work on will be the increase of engagement before, during and after the training process. In addition to interactivity and a supportive working environment, there might be other variables to be identified and analysed that could be used to improve employee engagement.

5. Conclusion

The dissemination of Covid-19 has led workers to cooperate remotely with each other not only across continents but also within their own city or country. This consequence increased awareness of the need for this type of training and effectively improved interactions between team members in different countries and enhanced workers' sense of belonging to their team (Zhang, R., Mestre, P., Serodio, C., Prada, M., & Wenjuan, G. A. O., 2020).

In fact, these circumstances have particularly changed the way a team works. Indeed, as much research has argued, a crisis can stimulate the willingness of some people to cooperate, for example, to ignore previous disagreements in order to deal with a common situation. But even when the intent to cooperate is present, the incessant stress present during a crisis makes it significantly more difficult for teams to sustain coordinated performance over time. In such cases, a focused attention on teamwork is required (Tannenbaum, S. I., Traylor, A. M., Thomas, E. J., & Salas, E., 2021). For this reason, we decided to investigate teamwork training more specifically, since this type of content is becoming strategic and necessary in a learning programme, to educate workers in a new working approach.

Therefore, after an intensive and thorough review of the literature on the elements mentioned above, we started to hypothesise the correlations between the variables that seemed to be most reasonable according to the research of previous authors. In addition, we decided to investigate the role of commitment during the learning process to see how it could be improved to influence the effectiveness of the training.

Analysing the role played by interactivity, we can state that by using more interactive tools it is easier to stimulate the attention of the trainees and improve their learning abilities. The effectiveness of the interactive training programme could be attributed to several factors, including the fact that the interactive training programme consisted of a group of activities relevant to real-world contexts, where workers could find themselves and be able to identify the relevant aspects and apply them during their work.

Talking about the working environment we can say that working from home requires adequate space and tools, trust in the respective colleagues, open communication, and flexibility, especially considering that team members may have different clinical or personal circumstances that may require non-traditional working hours and self-organisation of tasks. Team leaders need to pay special attention to how to sustain meaningful connections and maintain communication with team members (Orsini, C., & Rodrigues, V., 2020).

While commitment can take on the function of a mediator, the variable that helps to explain the phenomenon that occurs between interactivity and the effectiveness of online training to group work and between the latter variable and a favourable working environment. In fact, commitment represents the desire to learn and apply the knowledge acquired, the commitment shown during the learning process.

Finally, it is important to specify that the research started in January 2020 to contribute to the literature related to Covid-19, where the gaps to be filled are many as it is a new phenomenon.

5.1. Limitations and suggestions for future research

In this research study, in addition to the research contributions, there are limitations to its extension and generalisation, which we will highlight in order to make suggestions for future research on this topical issue.

First, the main limitation concerns the sample as it is composed of only 200 randomly selected respondents, so it is a small representation considering how widespread online education is nowadays, and it does not even show the results of a specific target group, as the sample was randomly selected. It is therefore not possible to extend the validity of the results to the general population. Furthermore, 70.5 % of the respondents were women, which means that the sample is much more representative of this population, a different gender distribution could have given different results. In future research it would be interesting to analyse different specific samples, established a priori, to have a comparison between the respective populations. For example, comparing different generations considering their different approach towards technologies.

Furthermore, it is important to mention that the focus is on online teamwork training, so the data was collected and analysed on this specific type of learning, consequently it is not possible to extend the result to any type of training. Moreover, another point of attention should be the type of online teamwork training analysed, while reviewing the literature we discovered the expansion of the use of gamification in learning programmes. Since through this study, we have confirmed the importance of interactivity in training, it would be more interesting to investigate the application of this technique and its results in terms of engagement and effectiveness. Another input for future research could be to investigate other interactive methods that are being developed.

Moreover, the data collection was conducted from March to April 2021, when almost all countries were in isolation or in a similar situation, this situation could influence the results due to a general psychological situation so it is not recommended to generalize our results, however it will be useful to repeat the survey during a normal situation, post pandemic. Also, regarding the timing of data collection, we would like to suggest carrying out a similar study but planned to collect information

before, during and after the training. This aspect could be useful to explore and define the role of the variable expectancy, which could be introduced as a moderator.

Finally, by identifying possible errors, we find that the choice of scales could lead to bias, in fact we show that repeating the same scale in neighbouring questions can influence respondents in choosing the same answer. In order to solve this situation, we suggest, for future studies, to select different scales, perhaps alternating them.

6. References

- Afrouz, R., & Crisp, B. R. (2021). Online education in social work, effectiveness, benefits, and challenges: A scoping review. *Australian Social Work, 74*(1), 55-67.
- Agrawal, S., De Smet, A., Lacroix, S., & Reich, A. (2020). To emerge stronger from the COVID-19 crisis, companies should start reskilling their workforces now. *McKinsey Insights*.
- Alsawaier, R. S. (2018). The effect of gamification on motivation and engagement. *The International Journal of Information and Learning Technology*.
- Alves, P., Miranda, L., & Morais, C. (2017). The influence of virtual learning environments in students' performance. *Universal Journal of Educational Research, 5*(3), 517-527.
- Anderson, T. (Ed.). (2008). *The theory and practice of online learning*. Athabasca University Press.
- Arthur Jr, W., Bennett Jr, W., Edens, P. S., & Bell, S. T. (2003). Effectiveness of training in organizations: A meta-analysis of design and evaluation features. *Journal of Applied psychology, 88*(2), 234.
- Askari, G., Asghri, N., Gordji, M. E., Asgari, H., Filipe, J. A., & Azar, A. (2020). The impact of teamwork on an organization's performance: A cooperative game's approach. *Mathematics, 8*(10), 1804.
- Badayai, A. R. A. (2012). A theoretical framework and analytical discussion on uncongenial physical workplace environment and job performance among workers in industrial sectors. *Procedia-Social and Behavioral Sciences, 42*, 486-495.
- Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology, 51*(6), 1173.
- Batalla-Busquets, J. M., & Martínez-Argüelles, M. J. (2014). Determining factors in online training in companies. *The International Journal of Management Education, 12*(2), 68-79.
- Bedingham, K. (1997). Proving the effectiveness of training. *Industrial and Commercial Training*.
- Beinicke, A., & Kyndt, E. (2020). Evidence-based actions for maximising training effectiveness in corporate E-learning and classroom training. *Studies in Continuing Education, 42*(2), 256-276.
- Bishop, J. W., Scott, K. D., & Burroughs, S. M. (2000). Support, commitment, and employee outcomes in a team environment. *Journal of management, 26*(6), 1113-1132.
- Bonk, C. J. (2002). *Online training in an online world*. Bloomington, IN: CourseShare. com.
- Brown, J. (2002). Training needs assessment: A must for developing an effective training program. *Public personnel management, 31*(4), 569-578.
- Burgoon, J. K., Bonito, J. A., Bengtsson, B., Ramirez Jr, A., Dunbar, N. E., & Miczo, N. (1999). Testing the interactivity model: Communication processes, partner assessments, and the quality of collaborative work. *Journal of management information systems, 16*(3), 33-56.
- Castro, I. D. (1993). Effective training in work organizations. *Estudos de Gestão, 1*(1), 19-28.
- Chatterjee, A., Pereira, A., & Sarkar, B. (2018). Learning transfer system inventory (LTSI) and knowledge creation in organizations. *The Learning Organization*.
- Chun, H. K., Comyn, P., & Moreno da Fonseca, P. (2021). Skills development in the time of COVID-19: taking stock of the initial responses in technical and vocational education and training.

- Churchland, P. S., & Winkielman, P. (2012). Modulating social behavior with oxytocin: how does it work? What does it mean? *Hormones and behavior*, 61(3), 392-399.
- De Jong, T., & Sarti, L. (Eds.). (1994). *Design and production of multimedia and simulation-based learning material*. Kluwer.
- Denby, S. (2010). The importance of training needs analysis. *Industrial and commercial training*.
- Den Otter, A., & Emmitt, S. (2007). Exploring effectiveness of team communication. *Engineering, Construction and Architectural Management*.
- Dillon, A., & Gabbard, R. (1998). Hypermedia as an educational technology: A review of the quantitative research literature on learner comprehension, control, and style. *Review of educational research*, 68(3), 322-349.
- Dolan, V. (2011). The isolation of online adjunct faculty and its impact on their performance. *International Review of Research in Open and Distributed Learning*, 12(2), 62-77.
- Dung, D. T. H. (2020). The advantages and disadvantages of virtual learning. *IOSR Journal of Research & Method in Education*, 10(3), 45-48.
- Dutta K. (2020). How remote learning can help organizations keep employees engaged during lockdown. *In People matters*.
- Egan, T. M. (2008). The relevance of organizational subculture for motivation to transfer learning. *Human Resource Development Quarterly*, 19(4), 299-322.
- Eisenberger, R., Huntington, R., Hutchison, S., & Sowa, D. (1986). Perceived organizational support. *Journal of Applied psychology*, 71(3), 500.
- Eisenberger, R., Stinglhamber, F., Vandenberghe, C., Sucharski, I. L., & Rhoades, L. (2002). Perceived supervisor support: contributions to perceived organizational support and employee retention. *Journal of applied psychology*, 87(3), 565.
- Gheith, E., & Aljaberi, N. M. (2017). The Effectiveness of an Interactive Training Program in Developing a Set of Non-Cognitive Skills in Students at University of Petra. *International Education Studies*, 10(6), 60-71.
- Greer, J. E., Mccalla, G., Collins, J. A., Kumar, V. S., Meagher, P., & Vassileva, J. (1998). Supporting peer help and collaboration in distributed workplace environments. *International Journal of Artificial Intelligence in Education (IJAIED)*, 9, 159-177.
- Hackman, R. J. (2002). *Leading teams: Setting the stage for great performances*. Harvard Business Press.
- Hamburg, I., Terstriep, J., & Engert, S. (2011). Promoting online education for new working environments in companies. In *Marketing online education programs: frameworks for promotion and communication* (pp. 337-358). IGI Global.
- Hamidi, N. N. E., Mansor, F. A., Hashim, M. Z., Muhammad, N., & Azib, W. N. H. W. (2020). The Relationship between Physical Workplace Environment and Employees' Performance. *Journal of Contemporary Social Science Research*, 4(1), 56-67.
- Hamtini, T. M. (2008). Evaluating e-learning programs: An adaptation of Kirkpatrick's model to accommodate e-learning environments. *Journal of Computer Science*, 4(8), 693.
- Hanaysha, J. (2016). Examining the effects of employee empowerment, teamwork, and employee training on organizational commitment. *Procedia-Social and Behavioral Sciences*, 229, 298-306.

- Harter, J. K., Schmidt, F. L., & Hayes, T. L. (2002). Business-unit-level relationship between employee satisfaction, employee engagement, and business outcomes: a meta-analysis. *Journal of applied psychology, 87*(2), 268.
- Harvey, L. (2000). New realities: The relationship between higher education and employment. *Tertiary Education & Management, 6*(1), 3-17.
- Hill, N. S., & Bartol, K. M. (2016). Empowering leadership and effective collaboration in geographically dispersed teams. *Personnel Psychology, 69*(1), 159-198.
- Hirsch, A. S. (2019). Building and leading high-performing remote teams. *SHRM. SHRM, August 16*.
- Holton III, E. F., Bates, R. A., & Ruona, W. E. (2000). Development of a generalized learning transfer system inventory. *Human resource development quarterly, 11*(4), 333-360.
- Jain, R., & Kaur, S. (2014). Impact of work environment on job satisfaction. *International journal of scientific and research publications, 4*(1), 1-8.
- Jayalath, J., & Esichaikul, V. (2020). Gamification to enhance motivation and engagement in blended eLearning for technical and vocational education and training. *Technology, Knowledge and Learning, 1-28*.
- Klein, C., DiazGranados, D., Salas, E., Le, H., Burke, C. S., Lyons, R., & Goodwin, G. F. (2009). Does team building work? *Small Group Research, 40*(2), 181-222.
- Kirkpatrick, D. (1996). Great ideas revisited. *Training & Development, 50*(1), 54-60.
- Kirkpatrick, D. L., & Craig, R. L. (1970). Evaluation of training. *Evaluation of short-term training in rehabilitation, 35*.
- Kumar, V., & Pansari, A. (2015). Measuring the benefits of employee engagement. *MIT Sloan Management Review, 56*(4), 67.
- Kundu, S. C., & Lata, K. (2017). Effects of a supportive work environment on employee retention. *International Journal of Organizational Analysis*.
- Ladyshewsky, R., & Taplin, R. (2018). The interplay between organisational learning culture, the manager as coach, self-efficacy, and workload on employee work engagement. *International journal of evidence-based coaching and mentoring, 16*(2), 3-19.
- Lancaster, S., & Di Milia, L. (2015). Developing a Supportive Learning Environment in a.
- Long, L. K., DuBois, C. Z., & Faley, R. H. (2008). Online training: The value of capturing trainee reactions. *Journal of Workplace Learning*.
- Luthans, F., Norman, S. M., Avolio, B. J., & Avey, J. B. (2008). The mediating role of psychological capital in the supportive organizational climate—employee performance relationship. *Journal of Organizational Behavior: The International Journal of Industrial, Occupational and Organizational Psychology and Behavior, 29*(2), 219-238.
- Madjar, N. (2005). The contributions of different groups of individuals to employees' creativity. *Advances in Developing Human Resources, 7*(2), 182-206.
- Magazine, F. (2000). E-Learning: Leading Strategies for Executive Education and Corporate Training.
- Martin, H. J. (2010). Workplace climate and peer support as determinants of training transfer. *Human resource development quarterly, 21*(1), 87-104.

- Martins, L. B., Zerbini, T., & Medina, F. J. (2019). Impact of online training on behavioural transfer and job performance in a large organization. *Revista de Psicología del Trabajo y de las Organizaciones*, 35(1), 27-37.
- Masaldzhyska, S. (2020). Challenges In Managing Virtual Teams. *Economic Science, education, and the real economy: Development and interactions in the digital age*, (1), 640-647.
- McGourty, J., & DeMeuse, K. P. (2001). *The team developer*. New York: John Wiley & Sons.
- Molino, M., Cortese, C. G., & Ghislieri, C. (2020). The promotion of technology acceptance and work engagement in industry 4.0: From personal resources to information and training. *International journal of environmental research and public health*, 17(7), 2438.
- Morgan, J. (2017). *The employee experience advantage: How to win the war for talent by giving employees the workspaces they want, the tools they need, and a culture they can celebrate*. John Wiley & Sons.
- Moore, M. L., & Dutton, P. (1978). Training needs analysis: Review and critique. *Academy of Management Review*, 3(3), 532-545.
- Murray, M. (2003). Managing teamwork online. *Proceedings of the OLT 2003-Excellence: making the connections*, 63-70.
- Naz, S., Li, C., Nisar, Q. A., Khan, M. A. S., Ahmad, N., & Anwar, F. (2020). A study in the relationship between supportive work environment and employee retention: role of organizational commitment and person–organization fit as mediators. *SAGE Open*, 10(2), 2158244020924694.
- Onwusuru, M. I., & Ogwo, B. A. (2019). Cloud-based portal for professional development of technology educators in Nigeria and the emerging virtual workplace. *International Journal of Arts and Technology Education*, 11(01), 1-17.
- Orsini, C., & Rodrigues, V. (2020). Supporting motivation in teams working remotely: The role of basic psychological needs. *Medical teacher*, 42(7), 828-829.
- Pan, Z., Cheok, A. D., Yang, H., Zhu, J., & Shi, J. (2006). Virtual reality and mixed reality for virtual learning environments. *Computers & graphics*, 30(1), 20-28.
- Pardo, A., & Román, M. (2013). Reflections on the Baron and Kenny model of statistical mediation. *Anales de psicología*, 29(2), 614-623.
- Parsons, M. B., Reid, D. H., & Green, C. W. (1996). Training basic teaching skills to community and institutional support staff for people with severe disabilities: A one-day program. *Research in developmental disabilities*, 17(6), 467-485.
- Prieto, I. M., & Pérez-Santana, M. P. (2014). Managing innovative work behavior: the role of human resource practices. *Personnel Review*.
- Rafiq, M. (2015). Training evaluation in an organization using Kirkpatrick model: a case study of PIA. *Journal of Entrepreneurship & Organization Management*, 4(03), 152-162.
- Rapp, A., Hopfgartner, F., Hamari, J., Linehan, C., & Cena, F. (2019). Strengthening gamification studies: Current trends and future opportunities of gamification research.
- Ravet, S., & Layte, M. (1997). *Technology-based training: a comprehensive guide to choosing, implementing, managing and developing new technologies in training*. London: Kogan Page.
- Rhoades, L., Eisenberger, R., & Armeli, S. (2001). Affective commitment to the organization: The contribution of perceived organizational support. *Journal of applied psychology*, 86(5), 825.

- Rich, B. L., Lepine, J. A., & Crawford, E. R. (2010). Job engagement: Antecedents and effects on job performance. *Academy of management journal*, 53(3), 617-635.
- Rothwell W, Sullivan R, McLean G (1995). *Practicing Organization Development: A Guide for Consultants*. San Francisco, CA: Jossey-Bass Pfeiffer.
- Roberts, P., & Priest, H. (2006). Reliability and validity in research. *Nursing standard*, 20(44), 41-46
- Salas, E., & Rosen, M. A. (2013). Building high reliability teams: progress and some reflections on teamwork training. *BMJ quality & safety*, 22(5), 369-373.
- Salas, E., Rozell, D., Mullen, B., & Driskell, J. E. (1999). The effect of team building on performance: An integration. *Small group research*, 30(3), 309-329.
- Santos, A., & Stuart, M. (2003). Employee perceptions and their influence on training effectiveness. *Human resource management journal*, 13(1), 27-45.
- Santos, S. A., Trevisan, L. N., Veloso, E. F. R., & Treff, M. A. (2021). Gamification in training and development processes: perception on effectiveness and results. *Revista de Gestão*.
- Sasmita, N., & Kumar, R. H. (2018). Exigency of re-skilling for organization and employee's growth. *Soc. Sci*, 3, 65-67.
- Schaufeli, W. B. (2013). What is engagement? *Employee engagement in theory and practice*, 15, 321.
- Schippers, M. C., West, M. A., & Dawson, J. F. (2015). Team reflexivity and innovation: The moderating role of team context. *Journal of Management*, 41(3), 769-788.
- Schmeckle, J. M. (2003). Online training: An evaluation of the effectiveness and efficiency of training law enforcement personnel over the internet. *Journal of Science Education and Technology*, 12(3), 205-260.
- Scott, G., & Yates, K. W. (2002). Using successful graduates to improve the quality of undergraduate engineering programmes. *European journal of engineering education*.
- Shalley, C. E., Zhou, J., & Oldham, G. R. (2004). The effects of personal and contextual characteristics on creativity: Where should we go from here? *Journal of management*, 30(6), 933-958.
- Shrivastava, A., Bartol, K.M. and Locke, E.A. (2006), "Empowering leadership in management teams: effects on knowledge sharing, efficacy, and performance", *Strategic Management Journal*, Vol. 49 No. 6, pp. 1239-1251.
- Sitzmann, T., & Weinhardt, J. M. (2018). Training engagement theory: A multilevel perspective on the effectiveness of work-related training. *Journal of Management*, 44(2), 732-756.
- Sözmen, E. Y., Karaca, O., & Batı, A. H. (2021). The effectiveness of interactive training and microlearning approaches on motivation and independent learning of medical students during the COVID-19 pandemic. *Innovations in Education and Teaching International*, 1-10.
- Straus, S. G., & McGrath, J. E. (1994). Does the medium matter? The interaction of task type and technology on group performance and member reactions. *Journal of applied psychology*, 79(1), 87.
- Tabassi, A. A., Ramli, M., & Bakar, A. H. A. (2011). Training, motivation, and teamwork improvement: The case of construction firms. *African journal of business management*, 5(14), 5627-5636.
- Tannenbaum, S. I., Traylor, A. M., Thomas, E. J., & Salas, E. (2021). Managing teamwork in the face of pandemic: evidence-based tips. *BMJ quality & safety*, 30(1), 59-63.

- Thompson, L. F., & Coover, M. D. (2003). Teamwork online: The effects of computer conferencing on perceived confusion, satisfaction, and post discussion accuracy. *Group Dynamics: Theory, Research, and Practice*, 7(2), 135.
- Toogood, S. (2008). Interactive training. *Journal of Intellectual and Developmental Disability*, 33(3), 215-224.
- Warkentin, M., & Beranek, P. M. (1999). Training to improve virtual team communication. *Information systems journal*, 9(4), 271-289.
- Wellins, S., Byham, C., & Wilson, P. (1994). Building a self-directed work team. *Managing learning*, 165-172.
- Yuan, N. H., Xue, Y. X., & Gao, A. (2007, November). Interactive distant skill training based on remote control technology. In *2007 First IEEE International Symposium on Information Technologies and Applications in Education* (pp. 244-247). IEEE.
- Zhang, R., Mestre, P., Serodio, C., Prada, M., & Wenjuan, G. A. O. (2020, August). Web-based teamwork: Distributed software development course under Covid-19. In *2020 15th International Conference on Computer Science & Education (ICCSE)* (pp. 45-50). IEEE.

Annex A

Run MATRIX procedure:

***** PROCESS Procedure for SPSS Version 3.5.3 *****

Written by Andrew F. Hayes, Ph.D. www.afhayes.com
 Documentation available in Hayes (2018). www.guilford.com/p/hayes3

Model : 4
 Y : Effe_ess
 X : Inte_ity
 M : Eng

Sample
 Size: 200

OUTCOME VARIABLE:
 Eng

Model Summary	R	R-sq	MSE	F	df1	df2	p
	,3215	,1034	,4733	22,8225	1,0000	198,0000	,0001

Model	coeff	se	t	p	LLCI	ULCI
constant	2,8417	,2369	11,9965	,0001	2,3745	3,3088
Inte_ity	,3021	,0632	4,7773	,0001	,1774	,4267

OUTCOME VARIABLE:
 Effe_ess

Model Summary	R	R-sq	MSE	F	df1	df2	p
	,3413	,1165	,3755	12,9900	2,0000	197,0000	,0001

Model	coeff	se	t	p	LLCI	ULCI
constant	2,8574	,2773	10,3053	,0001	2,3106	3,4042
Inte_ity	,2607	,0595	4,3833	,0001	,1434	,3780
Eng	,0667	,0633	1,0540	,2932	,0581	,1916

***** DIRECT AND INDIRECT EFFECTS OF X ON Y *****

Direct effect of X on Y	Effect	se	t	p	LLCI	ULCI
	,2607	,0595	4,3833	,0001	,1434	,3780

Indirect effect(s) of X on Y:	Effect	BootSE	BootLLCI	BootULCI
Eng	,0202	,0226	,0261	,0658

----- END MATRIX -----

Run MATRIX procedure:

***** PROCESS Procedure for SPSS Version 3.5.3 *****

Written by Andrew F. Hayes, Ph.D. www.afhayes.com
Documentation available in Hayes (2018). www.guilford.com/p/hayes3

Model : 4
Y : Effe_ess
X : Peer_sup
M : Eng

Sample
Size: 200

OUTCOME VARIABLE:

Eng

Model Summary

R	R-sq	MSE	F	df1	df2	p
,3952	,1562	,4454	36,6523	1,0000	198,0000	,0001

Model

	coeff	se	t	p	LLCI	ULCI
constant	2,5961	,2284	11,3651	,0001	2,1456	3,0465
Peer_sup	,3611	,0597	6,0541	,0001	,2435	,4788

OUTCOME VARIABLE:

Effe_ess

Model Summary

R	R-sq	MSE	F	df1	df2	p
,2707	,0733	,3939	7,7859	2,0000	197,0000	,0006

Model

	coeff	se	t	p	LLCI	ULCI
constant	3,0850	,2761	11,1718	,0001	2,5404	3,6296
Peer_sup	,1844	,0611	3,0201	,0029	,0640	,3049
Eng	,0762	,0668	1,1394	,2559	,0557	,2080

***** DIRECT AND INDIRECT EFFECTS OF X ON Y *****

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI
,1844	,0611	3,0201	,0029	,0640	,3049

Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
Eng	,0275	,0279	,0304	,0801

----- END MATRIX -----

Run MATRIX procedure:

***** PROCESS Procedure for SPSS Version 3.5.3 *****

Written by Andrew F. Hayes, Ph.D. www.afhayes.com
Documentation available in Hayes (2018). www.guilford.com/p/hayes3

Model : 4
Y : Effe_ess
X : Man_sup
M : Eng

Sample
Size: 200

OUTCOME VARIABLE:
Eng

Model Summary

R	R-sq	MSE	F	df1	df2	p
,2382	,0567	,4979	11,9066	1,0000	198,0000	,0007

Model

	coeff	se	t	p	LLCI	ULCI
constant	3,3384	,1839	18,1538	,0001	2,9758	3,7011
Man_sup	,1807	,0524	3,4506	,0007	,0774	,2840

OUTCOME VARIABLE:
Effe_ess

Model Summary

R	R-sq	MSE	F	df1	df2	p
,2741	,0752	,3931	8,0039	2,0000	197,0000	,0005

Model

	coeff	se	t	p	LLCI	ULCI
constant	3,1442	,2667	11,7882	,0001	2,6182	3,6703
Man_sup	,1480	,0479	3,0894	,0023	,0535	,2425
Eng	,1095	,0631	1,7335	,0846	,0151	,2340

***** DIRECT AND INDIRECT EFFECTS OF X ON Y *****

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI
,1480	,0479	3,0894	,0023	,0535	,2425

Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
Eng	,0198	,0138	,0058	,0482

----- END MATRIX -----

Run MATRIX procedure:

***** PROCESS Procedure for SPSS Version 3.5.3 *****

Written by Andrew F. Hayes, Ph.D. www.afhayes.com
Documentation available in Hayes (2018). www.guilford.com/p/hayes3

Model : 4
Y : Effe_ess
X : validity
M : Eng

Sample
Size: 200

OUTCOME VARIABLE:

Eng

Model Summary

R	R-sq	MSE	F	df1	df2	p
,5452	,2972	,3709	83,7411	1,0000	198,0000	,0001

Model

	coeff	se	t	p	LLCI	ULCI
constant	1,9925	,2181	9,1356	,0001	1,5624	2,4227
validity	,5449	,0595	9,1510	,0001	,4275	,6624

OUTCOME VARIABLE:

Effe_ess

Model Summary

R	R-sq	MSE	F	df1	df2	p
,2754	,0758	,3928	8,0835	2,0000	197,0000	,0004

Model

	coeff	se	t	p	LLCI	ULCI
constant	3,1340	,2676	11,7114	,0001	2,6063	3,6617
validity	,2276	,0731	3,1142	,0021	,0835	,3718
Eng	,0318	,0731	,4343	,6645	,1125	,1760

***** DIRECT AND INDIRECT EFFECTS OF X ON Y *****

Direct effect of X on Y

Effect	se	t	p	LLCI	ULCI
,2276	,0731	3,1142	,0021	,0835	,3718

Indirect effect(s) of X on Y:

	Effect	BootSE	BootLLCI	BootULCI
Eng	,0173	,0401	,0578	,1013