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EMPLOYEE ENGAGEMENT IN VIRTUAL TEAMS

The role of gamification

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Dissertation presented as partial requirement for obtaining the Master's degree in Information Management

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EMPLOYEE ENGAGEMENT IN VIRTUAL TEAMS: THE ROLE OF GAMIFICATION

by

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ABSTRACT

Remote and hybrid work were already becoming increasingly popular, but due to the global pandemic, it has become the new normality. To best navigate this new norm, we need to understand what can influence job engagement and consequently performance and what new factors we can use to further enhance these aspects. We study the antecedents of job performance and satisfaction, the impact of gamification and team virtuality and its influence on job performance. A survey across 323 individuals with some degree of team virtuality, found that job engagement is a relevant indicator of job performance, that gamification has potential to positively influence engagement and satisfaction and that higher team virtuality can lead to enhanced job performance. This study extends previous research on job engagement by combining it with its antecedents, team virtuality and gamification into a single model. While it is acknowledged that further research is required, this study provides relevant insights for managers and organizations aiming for higher job engagement and performance in this new working environment.

KEYWORDS

Gamification; Employee Engagement; Virtual Teams

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1. INTRODUCTION

The importance of employee engagement has been hugely covered in business literature (Shuck & Wollard, 2009) and many definitions emerged. Employee engagement can be defined as the individual involvement and satisfaction and enthusiasm for work (Harter et al., 2002). Engaged employees are proved to be more productive, profitable, more present and more willing to work hard for their company (Buchanan, 2004; Wiles, 2019) and it has also been identified as one of the three measures of a company's health along with customer satisfaction and free cash flow (Vance, 2006) – however, employee engagement continues low in most companies (Wiles, 2019) and employee retention is a growing challenge in the modern workplace (R. Mitchell et al., 2020). Remote work was already becoming increasingly popular globally due to traffic congestion and widespread of connectivity (Bloom et al., 2014), however, the recent outbreak of COVID-19 has revolutionized the way we live and work (Brynjolfsson et al., 2020; Minahan, 2021) forcing employees across occupations to work from home (Kramer & Kramer, 2020). Companies were rapidly forced to adapt and become fully digitized — and as they invest in fixed costs related to remote work, most will continue using them and adopt a hybrid work model possibility indefinitely. However, preparing for the digital future is not simple and requires developing a series of digital capabilities aligned with organizational goals (Kane et al., 2016). In a post-pandemic setting, where worker morale and burnouts continue to be a problem (York, 2021), the challenge for organizations lays on adapting to a new, more complex hybrid workforce where employees will be able to choose whether they want to go to office or not (Arlington, 2020; Minahan, 2021). And while remote work is not new, degree of remote work moving forward will change the dynamics, forcing companies to find effective and innovative ways to connect and engage employees.

More recently we have witnessed an accelerated growth of organizations such as L'Oréal, Deloitte and Starbucks applying game mechanics and design principals to their internal programs promoting an engaging work environment (Sarangi & Shah, 2015), and gamification has been widely applied in a broad range of industries such as finance, health, education and entertainment (Deterding et al., 2011) as a way to foster engagement and performance (Groening & Binnewies, 2019). Gaming and video games, in general are now seen as a significant part of society as 65% of American adults play video games and players represent a diverse cross-section of the American population ranging every age, gender and ethnicity (ESA, 2019). Despite the extensive amount of research on both employee engagement and gamification, gamification results and literature are still scattered (Baptista & Oliveira, 2019) and academic evidence of the effects or benefits of gamification is lacking (Yang et al., 2017) leaving a clear space for additional research on how gamification can impact engagement efforts.

In a volatile and face-paced world where technology has been commoditized, the challenge lays in building models to integrate humans with technologies as a way of creating new habits and management practices resulting in people working successfully with the technology available to them (Volini et al., 2020).

While academic research is limited in deeply understanding employee engagement in virtual teams (Shaik & Makhecha, 2019), various publications have highlighted its importance in this particular context (Shaik et al., 2020). Additionally, gamification has already been linked to employee engagement in different studies, however, few studies aimed at measuring the impact of

gamification on the overall success of employee engagement practices, particularly in virtual teams. The goal of this paper is to deepen the understanding of the impact that virtuality has on engagement antecedents as well as determine if gamification can play an important goal in enhancing that engagement, and consequently performance, in a virtual setting.

The contributions of this study are extensive and critical. Firstly, this research adds new empirical insights for addressing the challenges of engaging remote workers and therefore increase performance, while introducing gamification into the workplace (Cardador et al., 2017; Hammedi et al., 2021). Also, to the best of our knowledge there is no research combining all different, but extremely important variables, which include team virtuality, antecedents of job engagement and satisfaction as well as performance, and gamification. We add on the vast previous literature focused on the overall impact of gamification in the workplace (Groening & Binnewies, 2019; Gupta & Gomathi, 2017; Hammedi et al., 2021; Passalacqua et al., 2020; Robson et al., 2016) by introducing some degree of team virtuality which is extremely relevant in the time we're living in (Gleeson, 2021), and certainly has a large influence when compared with a traditional in-person work experience. Our insights provide a more concrete overview of the dynamics of remote workers and their engagement and satisfaction towards the work they develop and well as their consequent job performance, while also contributing to the validation of gamification as a driver of engagement in the corporate context. These contributions are particularly relevant in a practical approach by organizations and managers as they navigate the new working dynamics, namely the hybrid environment, and need to understand what influences and enhances engagement, making sure that their workforce is motivated and performing to the best of their abilities.

This paper will be structured as follows. Next chapter presents a theoretical background on the concepts of employee engagement, virtual teams, elaborates on employee engagement in virtual teams and the concept of gamification, followed by previous studies on the application of gamification in similar contexts. The research model and hypotheses are presented next, data collection methodology, questionnaire design and sample explanation. Lastly, the results are presented and reviewed as well as limitations to this study and final thoughts.

2. LITERATURE REVIEW

The theoretical background will focus on three main pillars, namely the definition of employee engagement, its transition to a purely digital context, the definition, and common uses for gamification and lastly on research regarding previous applications of gamification in the work environment and the potential that it has when considering a digital employee engagement strategy.

2.1. EMPLOYEE ENGAGEMENT AND SATISFACTION

Employee engagement is becoming a popular term among human resource management and development consultants (Shuck & Wollard, 2009). Described as an "emerging management phenomenon" (Hameduddin & Fernandez, 2019), employee engagement can be defined as the internal, emotional state of the employee including feelings such as commitment, dedication, motivation, passion, satisfaction, fulfillment, and emotional state to outcomes such as long term tenure and productivity (Burnett & Lisk, 2019; Schaufeli & Bakker, 2004) as well as enthusiasm for work, commitment, and pride in working for their employer (Harter et al., 2002). The root of engagement is establishing a connection between the experience and the individuals involved in the experience (Robson et al., 2016), therefore, when fully engaged, employees should be focused, emotionally connected and determined to perform at their best (Kahn, 1990; Rich et al., 2010) as well as more likely to venture beyond the bounds of their formally defined jobs and participate benefiting the work unit or organization (Rich et al., 2010) such as learning and development activities (Burnett & Lisk, 2019), speaking out and challenge their employers when appropriate(J. Kim & Gatling, 2018), resulting in meaningful business outcomes (Harter et al., 2002) such as higher employee retention and better customer service (Yohn, 2016). Highly engaged workforces benefit their companies by outperforming their peers by 147% in earnings per share (Yohn, 2016) being the reason why many leaders today spend enormous amounts of time and effort measuring and discussing employee engagement issues (Markey, 2014). Job satisfaction refers to the pleasurable or positive emotional state resulting from the appreciation for one's job or job experience – influenced by job characteristics, supervisors, and coworkers. When positive, individuals are more willing to carry out behaviors associated with tasks contributing to job effectiveness and performance. Job satisfaction suggest performance may be enhanced through different aspects of the self that operate with relative interdependence (Kahn, 1990). In a post pandemic setting, employees are seen as the most important group to a company achieving long-term success, surpassing customers and clients (Edelman, 2021). Among the various drivers of employee engagement and satisfaction we can find corporate culture, management style and competing priorities outside of work (Fuller, 2014) as well as value congruence, perceived organizational support and core self-evaluations (Rich et al., 2010). Despite all the advantages that engaged employees have for the organization they work for, employee engagement remains a challenge for companies worldwide (Markey, 2014) as just 30% of employees are reported to actively apply their talent, abilities and energy to drive their organizations forward and are committed to doing a good job (W. C. Kim & Mauborgne, 2014) making it crucial for leaders today to figure out new ways to impact their employees since today employees have more power and leverage when it comes to creating change within organizations (Edelman, 2021). And as the way in which employees communicate and work today is remarkably different from years ago (J. Kim & Gatling, 2018) and both technology and our overall environment are rapidly changing (Volini et al., 2020), leaders have been forced to be agile and creative in setting up structures and processes

so they meet expectations (Malhotra et al., 2007). As any change effort designed to boost engagement is likely to require time and resources (Burnett & Lisk, 2019), the digital environment offers unique value for leaders and employees as a way to not only track productivity, workflows but also workplace interactions and virtual engagement easily.

2.2. TEAM VIRTUALITY

Working remotely is becoming an increasingly common practice globally (Bloom et al., 2014) due to changes in the environment such as digitization, globalization and increased complexity, forcing organizations to take advantage of technology and communication tools to stay competitive and build global skilled teams (Shaik & Makhecha, 2019). It's reported that the number of people working remotely increased by 159% over the last 12 years and this trend is expected to grow with 73% of teams projected to include remote employees by 2028 (Gavin, 2020). The key factor driving the pivot to remote work is the growing impact of COVID-19 (Gavin, 2020) which will permanently change the workplace and jobs (Venkatesh, 2020). Before roughly 5% of Americans worked from home but the figure had risen to 62% in 2020 (The Economist, 2020). Companies like Twitter, Facebook, eBay and Shopify have announced measures making work from home a new norm (Dwoskin, 2020)(Gleeson, 2021) while others introduced flexible working options allowing employees to choose their preferred working location (Kelly, 2021). Team virtuality can be defined as the extent to which team members rely on virtual tools to carry on daily tasks (Costa et al., 2021), the amount of information value provided by such tools and the synchronicity of team member virtual interaction (Kirkman & Mathieu, 2005) - the more teams rely on virtual tools to work and communicate, the higher the level of virtuality. The most common referred dimensions of virtuality are the level of geographical/temporal dispersion and the level of technology use (Handke et al., 2020). Inevitably resistance to this type of work is linked to aspects such as traditionalist, lack of trust, gender and generational composition of teams we well as lack of interest and desire (Kramer & Kramer, 2020), and teams that suddenly became virtual due to the pandemic lockdowns, added further challenges (Costa et al., 2021). Despite all benefits of virtual teams for organizations, such as leveraging geographically dispersed expertise, 24/7 productivity, lower operational costs, larger life span, and larger motivation to achieve greater results (Purvanova, 2014), research has demonstrated that they present significant challenges — communication and collaboration difficulties, isolation, difficulties in building trust amongst team members and potentially lower team engagement (Dulebohn & Hoch, 2017)(Moore, 2021) as well as low employee morale, low motivation, low engagement and burnout and lack of work/life balance (York, 2021).

2.3. GAMIFICATION

Gamification can be defined as the process of using game thinking, mechanics and elements outside the games industry (Deterding et al., 2011), transferring the motivational potential of video games to non-game settings (Groening & Binnewies, 2019). More than simply making an activity playful, gamification uses game aspects such as challenge, trill, competition, rewards as well as other elements like fun, enjoyment and social rewards to make every day simple tasks more engaging

(Sarangi & Shah, 2015). Driven by the increasing adoption and dissemination of video games, this concept is gaining growing presence and significance through applications, services and business in everyday life (Baptista & Oliveira, 2019) and it has been widely applied across various areas from finance to education, health, entertainment and more (Deterding et al., 2011; Pedreira et al., 2015) to motivate, drive engagement and change users' behavior (Goncalo Baptista & Oliveira, 2017; Hsu & Chen, 2018). Pointed out as an emerging HR and marketing technology trend with major potential, gamification utilizes the innate human desire for competitiveness, achievement, status, self-expression, altruism and completion (Gupta & Gomathi, 2017) and corporations have been using this method to strengthen how they communicate internally and externally with various stakeholders (Robson et al., 2016). While it may seem that games are mainly for kids (Kaplan, 2011) about 164 million people play video games in the United States alone, and three-quarters of all Americans have at least one gamer in their household (ESA, 2019), reaching a point where it can be regarded as an integral part of society (Groening & Binnewies, 2019).

3. RESEARCH MODEL AND HYPOTHESIS

According to the literature mentioned above, high engagement normally results in high performance, but gamification may have a positive, negative, or null effect on both engagement and satisfaction. Furthermore, these relationships may be strongly influenced by specific identified antecedents that are set to indicate higher or lower levels of engagement and satisfaction. In response, and because this study is meant to analyze these relationships only in employees with some degree of team virtuality, the conceptual model on Figure 1 was developed with the core purpose of assessing the potential antecedents job performance and the impact of gamification in a work setting. The left-hand side of our conceptual model shows the identified antecedents of job engagement and satisfaction. Through an extensive literature review of engagement, a large initial pool of potential factors that might have a significant effect over engagement and satisfaction were collected. Following Rich et al., 2010 line of thought, Value Congruence, Perceived Organizational Support and Core Self-Evaluations were selected as well as fit to organization mentioned on various studies but particularly on Mitchell et al., 2001. Team virtuality, a widely addressed factor gaining prominence in the literature on teams (Kirkman & Mathieu, 2005) is added as an important element impacting engagement, satisfaction and performance.

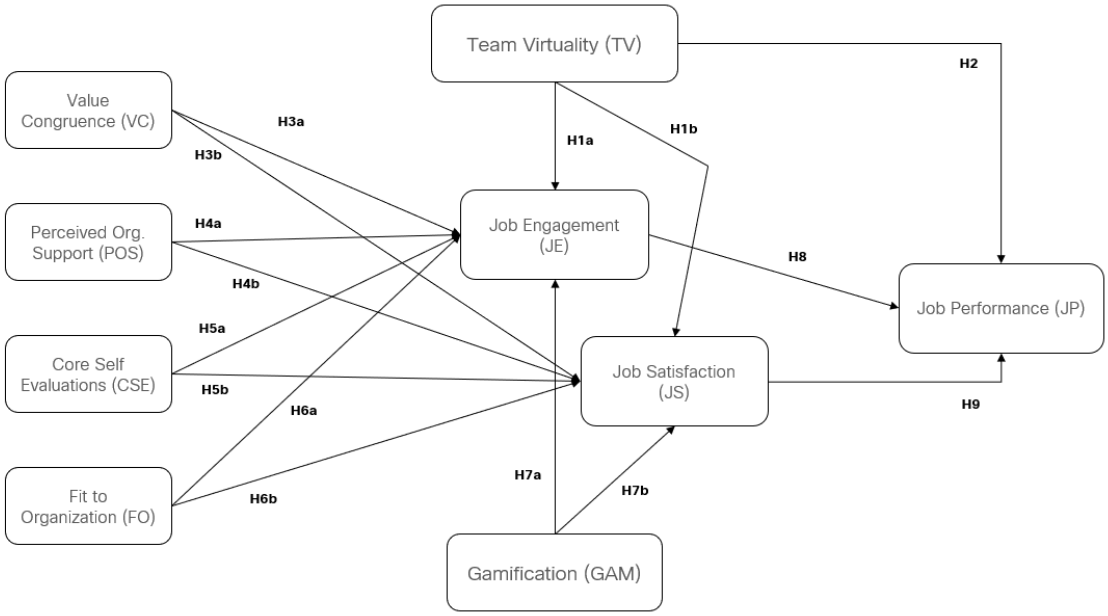

Figure 1. Proposed Conceptual Model

3.1. TEAM VIRTUALITY

Actions towards remote work limit interactions between employers, managers, and employees to a purely digital context leaving leaders with the responsibility of managing geographic dispersion, lack of cohesion (Malhotra et al., 2007) and limited communication channels (Kanawattanachai & Yoo, 2002) as well as maintaining a corporate culture and providing a seamless experience (Arlington,

2020) — establishing a virtual emotional connection and engaging with virtual employees has proven to be a huge challenge (Mishra & Jena, 2020) as research shows that as remote work is proven to impact job characteristics, such as job demands and job control and also job outcomes such as job performance, job satisfaction, organizational commitment and employee well-being (Ferrazzi, 2014; Venkatesh, 2020). Nevertheless, various authors found that remote work leads to increased autonomy of employees, thus positively impacting job satisfaction, performance, turnover intent, and role stress (Costa et al., 2021).

H1a: Team Virtuality has a negative effect on Job Engagement
H1b: Team Virtuality has a negative effect on Job Satisfaction
H2. Team Virtuality has a negative effect on Job Performance

3.2. Value congruence, Perceived organizational support, Core self-evaluations and Fit to organization

Value congruence refers to the psychological meaningfulness related to the investment in a professional role, resulting in the employee feeling worthwhile, useful, valuable and able to give themselves to their work (Kahn, 1990). When individuals believe their values are aligned with their organizations, they benefit not only the organization itself through work performance but also themselves, resulting in job engagement (Rich et al., 2010). Caldwell et al., (1990) focuses on the alignment between employee and organizations values.

H3a: Value congruence has a positive effect on job engagement.
H3b: Value congruence has a positive effect on job satisfaction.

Perceived organizational support is the experience of security and trust and being able to invest and participate in the organization and the job without fear of negative outcomes (Kahn, 1990) generally related to positive perceptions of feedback, reward systems, availability of relevant resources, and formal training provided (Costa et al., 2021). This is a result of the organization's supportive management and trustful interpersonal relationships with others. Consequences include the opportunity to take risks, expose themselves, ultimately higher engagement (Schaufeli & Bakker, 2004) as well as higher career satisfaction and intention to stay (Armstrong-Stassen & Ursel, 2009).

H4a: Perceived organizational support has a positive effect on job engagement.
H4b: Perceived organizational support has a positive effect job satisfaction.

Core self-evaluations are related to the individual's level of confidence in their abilities, resulting in putting their physical, cognitive and emotional energies into role performance (Kahn, 1990) as well as feeling available and prepared to engage fully in their role (Rich et al., 2010). Evidence shows that core self-evaluations are related to job satisfaction and job performance (Judge et al., 2003).

H5a: Core self-evaluations has a positive effect on job engagement.
H5b: Core self-evaluations has a positive effect on job satisfaction.

Fit to organization refers to the employee's perceived compatibility or comfort with the organization and its environment, considering their personal values, career goals, and future plans. The higher the fit, the higher likelihood that the employee will feel professionally and personally tied to the organization, decreasing turnover. The better one's fit and the more one sacrificed, the higher was their satisfaction and commitment. (T. R. Mitchell et al., 2001).

H6a: Fit to organization has a positive effect on job engagement.
H6b: Fit to organization has a positive effect on job satisfaction.

3.3. GAMIFICATION

Play has been identified as one of the three main reasons people work along with purpose and potential, who tend to increase performance. Play is when you are motivated by the work itself and work because you enjoy it and it's tied to curiosity, experimentation, and exploring challenging problems (McGregor & Doshi, 2015).

Leveraging gamification in the workplace, which does not mean transforming the work into a game but rather using game mechanics to energize desired worker behavior (Cardador et al., 2017), is proved to result in behavior changes (Robson et al., 2016; Wünderlich et al., 2020) particularly in employee engagement, satisfaction and productivity by making work more intrinsically motivating and the process more rewarding (Cardador et al., 2017). Gamification can unleash passion, potential and personal commitment — resulting in purposeful networks (Kaplan, 2011) and better performance overall (Groening & Binnewies, 2019). Also, teamwork and participation are set to be enabled by game mechanics (Neeli, 2012) thus the reason why it is being applied by companies to boost employee engagement and inspire employees to meet their job obligations more enthusiastically (Gupta & Gomathi, 2017) as well as to improve internal organizational processes, increase participation in training programs and improve recruitment processes. Gamification also plays with key dimensions that positively affect employees by providing a platform where they can get feedback on their performance, compare their achievements to others and understand whether they need to make corrections (Cardador et al., 2017). Visibility, comparability and immediacy of performance information encouraged by work gamification, from the perspective of organizations, forces managers to clarify priorities and recognize job performance concerns, enable adjustments, and acts as a vehicle to control work motivation and effectiveness when remote work is in practice (Cardador et al., 2017). Gamification is proven that when applied to the workplace can enhance employee engagement, satisfaction and led to better performance (Groening & Binnewies, 2019; Passalacqua et al., 2020; Robson et al., 2016; Wünderlich et al., 2020). Based on this, we propose that gamification has a positive effect on both job engagement and job satisfaction.

H7a: Gamification has a positive effect on job engagement.
H7b: Gamification has a positive effect on job satisfaction.

3.4. JOB ENGAGEMENT AND JOB SATISFACTION

Engagement reflects the investment of cognitive, emotional, and physical energies in a way in which one is actively involved in the performance of the role – resulting in job engagement mediating the relationship between the earlier mentioned constructs and job performance. Studies show that employees reporting higher levels of engagement appear to get a higher work performance ranking (Groening & Binnewies, 2019; Kahn, 1990; Rich et al., 2010), as engaged employees not only invested their energy into executing the tasks in their job description, but also tended to be helpful, courteous, and involved in organizational matters (Rich et al., 2010) by perhaps increasing the breadth of the activities that individuals consider to be part of their roles. We propose that job engagement positively impact job performance.

H8: Job engagement has a positive effect on job performance.
H9: Job satisfaction has a positive effect on job performance.

4. METHOD

An online survey was applied to collect data and test the proposed conceptual model. The survey was divided into four sections: the first accessing and filtering respondents who were, at the time, working from home / remotely, the second with the model's central constructs, the third with questions regarding gamification and the last with demographics characteristics. The items and scales were adapted from various sources referenced throughout this paper. Items were measured on a seven-point Likert scale whose answer choice ranges from (1) Strongly Disagree to (7) Strongly Agree. Two exceptions were made to measure satisfaction, using a different scale ranging from "Extremely dissatisfied" (1) to "Extremely satisfied" (7) and to measure frequency using "Never" (1) to "Always" (7). Sociodemographic questions were added to characterize the study sample namely age, gender, highest educational degree, role seniority and organization's industry. In order to review if the language used was clear and objective and the survey was well constructed and easy to understand, a pre-test was conducted by 30 respondents.

The survey hosted on Qualtrics was written in English and was distributed online through e-mail, social media, and instant messaging to personal and professional acquaintances between February and March 2021. The target population comprised employed individual adults who were working from home at the time they answered. 354 responses were collected and filtered to respondents who answered positively to the first question accessing if they were working from home, resulting in 323 responses selected for the study.

Concerning demographic data (Table 1), 46% of respondents are male, 53% are female and the average age is 36 years old. Their education level corresponds to Master or Postgraduate level for the majority of respondents (53%) and bachelor's level for 37%. Respondents are divided into various industries with Information Technology corresponding to 50%.

	N	%		N	%		N	%
Age			**Gender**			**Education**		
< 18	0	0%	Male	150	46%	No school degree completed	1	0.3%
18–24	41	13%	Female	170	53%	High School Degree	22	7%
25–34	119	37%	Prefer not to say	3	1%	Bachelor's Degree	121	37%
35–44	100	31%				Master's or Postgraduate D.	171	53%
45–54	47	15%				Doctorate Degree	8	2.4%
55–64	15	5%						
64 >	1	0%						
Organization's Industry			**Position Level in Organization**					
Retail	9	3%	Entry Level	150	46%			
Manufacturing	10	3%	Supervisor	74	23%			
Finance	21	7%	Middle Management	71	22%			
Professional Services	36	11%	Senior Management	28	9%			
Energy and Utilities	9	3%						
Information Technology	161	50%						
Public Sector	21	7%						
Other	56	17%						

Table 1. Demographic data of responses

5. RESULTS

Structural equation modelling (SEM) is a statistical method used to test and estimate causal relationships using a mix of statistical data and qualitative causal assumptions. The models were estimated with partial least squares (PLS) which is a variance-based method, and the one used in this paper. Smart PLS v. 3.3.3 was the software used to analyze the relationships defined by the theoretical model (Ringle et al., 2015).

5.1. MEASUREMENT MODEL

Various measures were analyzed to assess the measurement model. Construct reliability (CR) was tested using the composite reliability coefficient. As shown on Table 2, all constructs have a composite reliability above 0.7 (Straub, 1989), suggesting that the constructs are satisfactory. Cronbach's alpha is higher than 0.70 indicating higher levels of reliability.

Indicator reliability was assessed based on the criteria that the loadings should be greater than 0.7 and that every loading less than 0.4 should be excluded (Henseler et al., 2009). As shown in Table 3, loadings are greater than 0.7. Convergent validity was tested through the average variance extracted (AVE), which has a minimum reference value of 0.50 indicating that the latent variables explain more than half of the variance of their indicators (Henseler et al., 2009). AVE values on Table 2 in bold are all above 0.5 ensuring convergence (Joseph F. Hair et al., 2019). These results guarantee that the measures used in this research are valid and reliable.

To evaluate discriminant validity, Fornell-Larcker criterion and cross-loadings approach were used. The first criterion postulates that the square root of AVE should be greater than the correlations between the construct (Fornell & Larcker, 1981). The second criterion requires that the loading of each indicator should be greater than all cross-loadings (Chinn & Chin, 1998). As seen on table 2 the square roots of AVEs (diagonal elements) are higher than the correlation between each pair of constructs (off-diagonal elements). Table 3. shows that loadings are greater than cross-loadings, thus indicating that the model also has a favorable indicator reliability, convergent validity, and discriminant validity, allowing the use of all constructs to test the structural model. Finally, HTMT is an advantageous approach to gain insights into discriminant validity. If the HTMT value is below 0.90, discriminant validity has been established between reflective constructs, as demonstrated in appendix B (Henseler et al., 2015).

In conclusion, all constructs can be used to test the structural model.

	Mean	**SD**	**CR**	**CA**	TV	VC	POS	CSE	FO	JE	JS	GAM	JP
Team Virtuality	5.512	1.424	0.883	0.823	**0.809**								
Value Congruence	5.699	1.104	0.922	0.894	0.448	**0.839**							
Perceived Organizational Support	5.692	1.191	0.946	0.929	0.420	0.744	**0.883**						
Core Self Evaluations	5.860	0.789	0.900	0.851	0.316	0.441	0.448	**0.832**					
Fit to Organization	5.815	1.073	0.932	0.891	0.464	0.804	0.714	0.562	**0.906**				
Job Engagement	5.524	1.094	0.941	0.927	0.404	0.790	0.699	0.552	0.824	**0.835**			
Job Satisfaction	5.468	1.169	0.942	0.908	0.342	0.674	0.651	0.482	0.787	0.803	**0.919**		
Gamification	5.183	1.383	0.937	0.900	0.182	0.207	0.187	0.310	0.260	0.288	0.277	**0.913**	
Job Performance	6.007	0.772	0.947	0.932	0.438	0.553	0.564	0.725	0.680	0.660	0.562	0.348	**0.864**

Table 2. Latent variables mean, standard deviations (SD), composite reliability (CR), Cronbach's Alpha (CA), and validity (AVE) measures.

Construct	Item	TV	VC	POS	CSE	FO	JE	JS	GAM	JP
Team Virtuality	TV_1	**0.802**	0.367	0.316	0.256	0.404	0.348	0.292	0.105	0.293
	TV_2	**0.745**	0.337	0.332	0.361	0.350	0.302	0.235	0.179	0.456
	TV_3	**0.806**	0.313	0.302	0.169	0.312	0.273	0.231	0.175	0.303
	TV_4	**0.877**	0.422	0.397	0.221	0.424	0.373	0.337	0.133	0.351
Value Congruence	VC1	0.371	**0.763**	0.531	0.429	0.629	0.596	0.456	0.179	0.525
	VC2	0.462	**0.863**	0.641	0.380	0.717	0.684	0.593	0.171	0.478
	VC3	0.344	**0.877**	0.607	0.324	0.680	0.684	0.573	0.17	0.393
	VC4	0.243	**0.800**	0.578	0.289	0.569	0.603	0.523	0.133	0.382
	VC5	0.444	**0.886**	0.742	0.428	0.760	0.733	0.658	0.21	0.542
Perceived	POS1	0.365	0.610	**0.878**	0.406	0.597	0.574	0.525	0.101	0.492
Organizational	POS2	0.396	0.657	**0.903**	0.390	0.636	0.606	0.553	0.172	0.499
Support	POS3	0.369	0.627	**0.916**	0.366	0.614	0.603	0.559	0.143	0.481
	POS4	0.397	0.672	**0.857**	0.409	0.636	0.611	0.572	0.193	0.510
	POS5	0.332	0.705	**0.860**	0.403	0.660	0.680	0.648	0.207	0.503
Core Self Evaluations	CSE1	0.311	0.345	0.360	**0.839**	0.429	0.430	0.327	0.235	0.618
	CSE2	0.295	0.365	0.335	**0.853**	0.465	0.472	0.363	0.254	0.677
	CSE3	0.214	0.407	0.391	**0.869**	0.496	0.502	0.485	0.243	0.605
	CSE4	0.246	0.343	0.400	**0.762**	0.472	0.424	0.408	0.302	0.515
Fit to Organization	FO1	0.423	0.737	0.658	0.59	**0.895**	0.743	0.663	0.230	0.693
	FO2	0.446	0.753	0.681	0.532	**0.920**	0.749	0.700	0.270	0.623
	FO3	0.394	0.696	0.605	0.412	**0.904**	0.747	0.772	0.208	0.538
Job Engagement	JE1	0.371	0.616	0.622	0.516	0.652	**0.785**	0.572	0.218	0.587
	JE2	0.337	0.658	0.577	0.499	0.699	**0.868**	0.763	0.232	0.583
	JE3	0.349	0.664	0.605	0.474	0.703	**0.848**	0.693	0.187	0.582
	JE4	0.322	0.523	0.432	0.421	0.573	**0.734**	0.525	0.192	0.518
	JE5	0.388	0.771	0.680	0.451	0.789	**0.897**	0.766	0.251	0.535
	JE6	0.290	0.645	0.551	0.449	0.671	**0.822**	0.644	0.338	0.525
	JE7	0.301	0.720	0.599	0.418	0.711	**0.880**	0.705	0.266	0.526
Job Satisfaction	JS1	0.307	0.653	0.633	0.454	0.751	0.779	**0.919**	0.231	0.538
	JS2	0.324	0.581	0.58	0.469	0.706	0.708	**0.922**	0.266	0.549
	JS3	0.312	0.622	0.579	0.402	0.710	0.723	**0.915**	0.269	0.457
Gamification	GAM1	0.187	0.211	0.193	0.29	0.257	0.277	0.263	**0.920**	0.317
	GAM2	0.152	0.185	0.143	0.283	0.214	0.25	0.256	**0.883**	0.319
	GAM3	0.157	0.168	0.175	0.276	0.240	0.261	0.240	**0.935**	0.316
Job Performance	JP1	0.351	0.440	0.424	0.657	0.568	0.516	0.472	0.318	**0.850**
	JP2	0.311	0.404	0.388	0.595	0.512	0.491	0.404	0.319	**0.852**
	JP3	0.360	0.471	0.473	0.642	0.575	0.538	0.466	0.332	**0.879**
	JP4	0.393	0.443	0.434	0.683	0.573	0.541	0.446	0.293	**0.888**
	JP5	0.394	0.540	0.505	0.629	0.640	0.645	0.520	0.275	**0.885**
	JP6	0.440	0.535	0.651	0.563	0.630	0.650	0.572	0.277	**0.831**

Table 3. Loading (in bold) and Cross-Loading for the measurement model.

5.2. STRUCTURAL MODEL

For the structural model estimation, both R2 measures and path coefficients level of significance were used. Figure 2 shows these results. VIF values are lower than 5 suggesting that the multicollinearity problem is excluded (Lee & Xia, 2010). The significance of the path coefficients was assessed using a bootstrapping procedure (Joe F. Hair et al., 2011; Henseler et al., 2009) with 5000 iterations of resampling (Chinn & Chin, 1998).

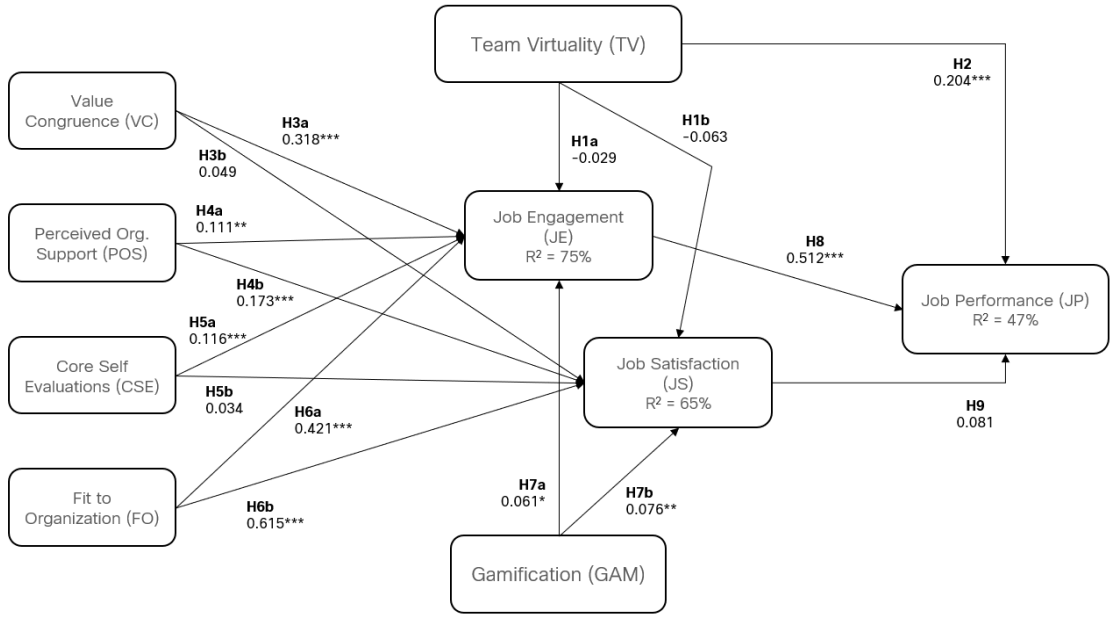

Figure 2. Structural model results, Note: *p < 0.05; **p < 0.010; ***p < 0.001

The model explains 75% of job engagement. Job engagement is explained by value congruence (β = 0.318; p < 0.001), perceived organizational support (β = 0.111; p < 0.05), core self-evaluations (β = 0.116; p < 0.01), fit to organization (β = 0.421; p < 0.001), and gamification (β = 0.061; p < 0.05). Consequently H3a, H4a, H5a, H6and H7a are confirmed. However, H1a is not supported.

The model explains 65% of job satisfaction, having as statistically significant variables perceived organizational support (β = 0.173; p < 0.001), fit to organization (β = 0.615; p < 0.001), and gamification (β = 0.076; p < 0.010) thus confirming hypothesis H4b, H6b, and H7b. Team virtuality, value congruence and core self-evaluations are not statistically significant in explaining job satisfaction, and consequently, H1b, H3b, and H5b are not confirmed.

The model explains 47% of job performance, being job engagement the most significant construct to explain job performance (β = 0.512; p < 0.001). Also, H2 is supported, hence team virtuality being significant in explaining job performance (β = 0.204; p < 0.001). H9, accessing the impact of job satisfaction on job performance, we conclude that this not statistically supported.

In sum, nine hypotheses are supported out of fifteen.

6. DISCUSSION

This study accesses the extent to which team virtuality and gamification impact job engagement and job satisfaction, and consequently job performance, considering four key antecedents of job engagement and job satisfaction. Table 4 summarizes the results presented with the conclusions of our hypotheses and the following discussion is presented in the order of our findings. Fit to organization was the most significant construct to explain both job engagement and job satisfaction ($\beta = 0.421$; $p < 0.001$) and ($\beta = 0.615$; $p < 0.001$). Fit to organization occurs when the employee perceives compatibility and comfort with its organization and environment (Mitchell et al., 2001) resulting in higher involvement and enthusiasm for work (Harter et al., 2002) as well as pleasurable and positive emotions towards their job experience such as meaningfulness, safety and availability (Kahn, 1990). After fit to organization, value congruence, the psychological meaningfulness that occurs when an employee's values are congruent with their organizations was the most significant construct to explain job engagement (Kahn, 1990; Rich et al., 2010). Perceived organizational support, which reflects employees' beliefs that their organization values their contributions and cares about their wellbeing, resulting in a sense of security and trust (Eisenberger et al., 1986) was the second most significant construct to explain job satisfaction. This research reinforces the important findings by Rich et al. (2010) and prove that there are important and crucial factors that influence and drive engagement and satisfaction within employees – having each antecedent a unique effect on engagement (Rich et al., 2010). Regarding team virtuality, the degree to which team members rely on virtual tools to perform daily tasks (Kirkman & Mathieu, 2005), our study shows that it has little to no influence on both job engagement and job satisfaction but, in turn, is a significant construct to explain job performance, which is consistent with the reported results on Costa et al. (2021) showing that virtual teams experience higher levels of performance when compared to face-to-face teams, yet experience low levels of satisfaction. This can be explain perhaps by the increased autonomy and task interdependence that virtual employees experience, which in turn is proven to positively impact satisfaction, performance, turnover intent, and stress (Costa et al., 2021). Based on these results set, we advance a logical hypothesis to why this might happen: virtual employees might experience does not explain engagement and satisfaction in the workplace but might actually be able to increase performance as theorized in (Costa et al., 2021). When looking at the impact of the implementation of game thinking, mechanics and elements in the workplace (Deterding et al., 2011), our study finds that it is positively connected to job satisfaction and partially to job engagement, confirms previous research by (Passalacqua et al., 2020; Wünderlich et al., 2020). Job performance, the employee's performance on job-related tasks and achievement of organizational objectives (Ali-Hassan et al., 2015) is strongly influenced mostly by job engagement, which fully accounts for the relationships between the antecedents and the performance outcomes (Rich et al., 2010) and is proven to be the most critical and pivotal antecedent of organizational performance.

Hypo-thesis	Path	Findings (β)	T Values	P Values	Conclusion
H1a	Team Virtuality -> Job Engagement	-0.029	0.698	0.485	Not Supported
H1b	Team Virtuality -> Job Satisfaction	-0.063	1.546	0.122	Not Supported
H2	Team Virtuality -> Job Performance	0.204	4.267	0.000	Not Supported
H3a	Value Congruence -> Job Engagement	0.318	4.791	0.000	Supported
H3b	Value Congruence -> Job Satisfaction	0.049	0.719	0.472	Not supported
H4a	Perceived Organizational Support -> Job Engagement	0.111	2.266	0.023	Supported
H4b	Perceived Organizational Support -> Job Satisfaction	0.173	3.200	0.001	Supported
H5a	Core Self Evaluations -> Job Engagement	0.116	2.685	0.007	Supported
H5b	Core Self Evaluations -> Job Satisfaction	0.034	0.653	0.514	Not supported
H6a	Fit to Organization -> Job Engagement	0.421	6.184	0.000	Supported
H6b	Fit to Organization -> Job Satisfaction	0.615	8.851	0.000	Supported
H7a	Gamification -> Job Engagement	0.061	1.946	0.052	Supported
H7b	Gamification -> Job Satisfaction	0.076	2.183	0.029	Supported
H8	Job Engagement -> Job Performance	0.512	6.960	0.000	Supported
H9	Job Satisfaction -> Job Performance	0.081	1.047	0.295	Not supported

Table 4. Results and hypotheses conclusions.

6.1. THEORETICAL AND MANAGERIAL IMPLICATIONS

Although this research was primarily intended to test theoretically derived hypotheses, our findings do have both theoretical and practical implications, particularly relevant in a time where managers and corporations are trying to tackle the added difficulties in managing and engaging remote or hybrid teams. In this sense, this paper contributes to the development of knowledge in this area. Previous research on the topics mentioned throughout this paper has been mainly grounded only on one side of the spectrum: either the antecedents leading to job engagement and satisfaction, and consequently to job performance, or the impact of the application of game design mechanics in the workplace. Additionally, to the best of our knowledge, little research has been done analyzing the impact of virtuality on engagement and performance. Taking this into account, this study aimed at studying exclusively workers with some degree of team virtuality, while addressing which aspects and antecedents were more meaningful to explain engagement and satisfaction while also measuring the impact of gamification, responding on calls for future research mentioned in various publications. Findings presented not only challenge contradicting literature outlining the real impact of team virtuality on employee's satisfaction and engagement but provide important insights on how organizations and managers can achieve engagement and consequent performance.

For managers seeking to implement internal strategies to enhance engagement and satisfaction on remote works, evidence shows the key aspects that should be taken into consideration when designing these practices, adding to the body of knowledge presented by Rich et al., 2010 and Kahn, 1990, while also adapting the data and facts to a more current reality. Employees value feelings related to organizational support as well as compatibility or comfort with the organization and its environment, resulting in satisfaction, well-being, and enjoyment. At a very high-level, results suggest that practices that enhance engagement employees consequently boost job performance, which is in alignment with most of the literature presented by Kahn, 1990 and Harter et al., 2002. However, contrary to expected and stated on mentioned literature (Harter et al., 2002), the same is

not true for job satisfaction, since it is not relevant in predicting performance. This pattern of findings suggests that employers should focus their efforts on activities enhancing engagement rather than satisfaction, which will result in higher performance.

In parallel, this study contributes to the evidence base for the utility of gamification as a valuable tool to enhance both engaging and satisfactory experiences at work, as respondents seem to respond well to this hypothesis, as according to mentioned literature such as (Cardador et al., 2017; Passalacqua et al., 2020; Robson et al., 2016) and more. This suggests that corporations and managers should seek to incorporate game-like initiatives as part of their internal strategies, not dispensing a closer look and prior analysis to avoid counterproductive effect (Hammedi et al., 2021; Passalacqua et al., 2020).

Responding to the large skepticism about the effectiveness of virtual teams when compared to face-to-face teams (Purvanova, 2014), the results presented found that higher levels of team virtuality can harm both engagement and satisfaction, but actually seem to enhance job performance. Such results could be related to some degree of bias regarding the self-assessment of job performance itself, but present an important finding for organizations today.

By uncovering significant antecedents and measure their level of impact and providing constructive answers to our research questions, we uncover major catalysts and directives necessary for companies to foster engagement and performance that will certainly hold great value when designing managerial incentives used to promote positive work climates and enjoyable work experiences, who were already proven to hold great promise (Hammedi et al., 2021). There is undoubtedly still a long path ahead to fully understand the real impact of team virtuality and remote work on engagement and work performance. In this sense, we identified several limitations that should be addressed in future research.

6.2. Limitations and Recommendations for Future Research

While this study adds to the current body of knowledge and the findings are generally supportive of our hypotheses, we also recognize its limitations, the first being the sample. Although respondents were well distributed in terms of age, gender, seniority, and area of work, no comparison was established between their perceptions working remotely and working in person, as the survey was only conducted while respondents were working remotely, resulting in a significant difficultly in establishing a more direct and reliable relationship between these variables. It is recommended that future research tests the same respondents both while working in person at an office space and working in the same position and organization remotely.

Additionally, the survey was conducted during the months of February and March 2021, a period of general uncertainty, productivity crisis, burnout and stress (Lyall, 2021). This state of prolonged stress due to Covid-19 inevitably has huge impacts on employee's wellbeing, engagement and satisfaction and overall perception of work-related topics (Stahl, 2021) and could have impacted their perceptions on the questions asked. Future research should prove the data obtained in this research through a new collection of data in a future period not affected by these factors.

Regarding the analysis of the impact of gamification, due to time constraints and lack of resources, this study only analyzed the acceptance and possible engagement increase when applied gamification. There was no gamification practice actually applied to respondents making it harder to access the actual impact. In future studies would be relevant to analyze the engagement of the same employees when gamification is in place and when it's not. Other useful research avenues include testing the effects of different gamification elements such as points, achievements and prizes on engagement and satisfaction.

Finally, all constructs where from self-report measures, and therefore, it is likely that method variance inflated the relationships among variables. Future research could be designed to reduce reliance on self-reports by, for instance, obtain feedback of both job engagement and specially job performance by work peers or direct managers working closely with focal employees.

7. CONCLUSIONS

Much research has been done covering both engagement and satisfaction in the workplace, the application gamification and more recently, virtual teams and remote work are quite frequent topics of study amongst business, marketing and human resources publications. Gamification, which tends to exploit the inherent human desires for competition, achievement, status, self-expression, altruism, and closure by applying game mechanics into a non-gaming setting (Gupta & Gomathi, 2017), has been studied and applied by several organizations in different industries as a way to foster engagement and satisfaction, proven to have positive outcomes. Simultaneously, team virtuality, which doesn't necessarily mean geographic dispersion between employees (Kirkman & Mathieu, 2005) as we've witnessed during the recent Covid-19 pandemic and consequent mandatory working from home policies, is an area of study that just now being explored and approached from different perspectives, as more teams were suddenly forced to become virtual, leading to further challenges. Through this study, we attempted to integrate existing literature and data and extend previous research by combining the antecedents of engagement and satisfaction and its outcome with team virtuality and gamification. Results of our study strongly supported a theoretical model grounded in this idea and were able to answer the research questions posed. Engagement was proven to have significant antecedents that should be considered in all domains which immensely impact performance. Gamification, which is still very much at the beginning of its journey, is proven to have promising results in engagement while team virtuality is proven to positively impact job performance. In a time where remote work and virtuality is reaching unexplored domains and having an unpredictable impact on the way employees engage with their organizations these findings are of great value for organizations. Nevertheless, at a time of constant change and adaptation to the current reality, there is still much to expose concerning engagement and performance during this new working environment.

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9. APPENDIX

Construct	Item	Description	Reference
Team Virtuality	TV1	I collaborate with people in different time zones	(Chudoba et al., 2005)
	TV2	I work with people via internet-based conferencing applications	
	TV3	I collaborate with people I have never met face to face	
	TV4	I collaborate with people who speak different languages from my own	
Value Congruence	VC1	What this organization stands for is important to me	(Caldwell et al., 1990)
	VC2	I talk up this organization to my friends as a great organization to work for	
	VC3	The reason I prefer this organization to others is because of what it stands for, that is, its values	
	VC4	I feel a sense of 'ownership' for this organization rather than being just an employee	
Perceived Organizational Support	POS1	My work supervisor cares about my opinions	(Eisenberger et al., 1986)
	POS2	My work supervisor really cares about my well-being	
	POS3	My work supervisor strongly considers my goals and values	
	POS4	Help is available from the organization when I have a problem	
	POS5	The organization takes pride in my accomplishments at work	(Armstrong-Stassen & Ursel, 2009)
Core Self Evaluations	CSE1	I am confident I get the success I deserve in life	(Judge et al., 2003)
	CSE2	When I try, I generally succeed	
	CSE3	I complete tasks successfully	
	CSE4	Overall, I am satisfied with myself	
	CSE5	I determine what will happen in my life	
Fit to Organization	FO1	My values are compatible with the organization's values	(Caldwell et al., 1990)
	FO2	I can reach my professional goals working for this organization	
	FO3	What this organization stands for is important to me	
Job Engagement	JE1	I feel encouraged to come up with new and better ways of doing things	Hameduddin & Fernandez, 2019)
	JE2	My work gives me a feeling of personal accomplishment	
	JE3	I am highly engaged in this job	(Saks, 2006)
	JE4	Sometimes I am so into my job that I lose track of time	
	JE5	Being a member of this organization is very captivating	
	JE6	One of the most exciting things for me if getting involved with things happening in this organization	(Saks, 2006)
	JE7	I am highly engaged in this organization	
	JE8	I feel like I am a good match for this company	
Fit to Organization	FO1	My values are compatible with the organization's values	(T. R. Mitchell et al., 2001)
	FO2	I can reach my professional goals working for this organization	
	FO3	What this organization stands for is important to me	(Caldwell et al., 1990)
Job Satisfaction		How satisfied are you with…?	
	JS1	The progress you are making toward the goals you set for yourself in your present position	(Janssen & Van Yperen, 2004)
	JS2	Your present job in light of your career expectations	
	JS3	With your job in general	(Saks, 2006)
Gamification	GAM1	If engaging in internal activities and initiatives was more fun/enjoyable I would probably participate more often	Adapted from: (Baptista & Oliveira, 2017)
	GAM2	If engaging in internal activities and initiatives gave me points, rewards and prizes I would probably participate more often	
	GAM3	If engaging in internal activities and initiatives was more fun/enjoyable I would	

		probably advice others to engage as well	
Job Performance	JP1	I always complete the duties specified in my job description	(Ali-Hassan et al., 2015) (Hwang et al., 2015)
	JP2	I always meet all the formal performance requirements of my job	
	JP3	I always fulfill all responsibilities required by my job	
	JP4	I perform well in my job overall	
	JP5	I provide the highest quality of performance in my job	
	JP6	My boss believes I provide the highest quality performance in my job	

Appendix 1. Constructs and items

	TV	VC	POS	CSE	FO	JE	JS	GAM	JP
Team Virtuality									
Value Congruence	0.514								
Perceived Organizational Support	0.477	0.808							
Core Self Evaluations	0.377	0.504	0.502						
Fit to Organization	0.539	0.898	0.783	0.646					
Job Engagement	0.459	0.863	0.747	0.620	0.905				
Job Satisfaction	0.392	0.742	0.704	0.541	0.872	0.871			
Gamification	0.212	0.229	0.201	0.355	0.290	0.316	0.307		
Job Performance	0.490	0.599	0.594	0.817	0.742	0.702	0.602	0.382	

Appendix 2. Heterotrait-Monotrait ratio (HTMT)