

Preliminary Literature Review

Play at Work

Prepared by

Dr Janneke Blijlevens (School of Economics, Finance and Marketing)

Jo Wong (School of Economics, Finance and Marketing)

Dr. Argho Bandyopadhyay (AB) (Graduate School of Business and Law)

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INTRODUCTION

Integrating play into the workplace may be counterintuitive in today's highly competitive business landscape. Traditionally, work environments are considered serious places where professionalism and productivity are paramount. It is often said, "*When you play, play hard; when you work, don't play at all*" (Pine 2012, p. 40). However, an increasing number of management experts argue that incorporating play strategically within the workplace does not diminish the seriousness of our professional pursuits; instead, it acts as a catalyst for creativity, collaboration, and employee satisfaction. Hence, the IDEO Partner and Play Lab Founder stated, "*The opposite of play isn't work. it's boredom*" (IDEO 2024).

Many leading global companies, such as Google, IDEO, and Pixar Animation Studios, have fully embraced incorporating play into the workplace (Stewart 2013). Google fosters creativity by holding meetings in Broadway-themed conference rooms and providing a Lego PlayStation for employees to relax. IDEO has its own Play Lab where employees can explore the innovative potential of play. Additionally, in Australia, companies like WiseTech, Rokt, and LEAP Dev are creating dynamic work environments through initiatives like pizza Fridays, video games, and weekend soccer matches (The Martec 2024). These companies prioritise a fun and social work environment by outfitting their office spaces with pool tables, ping pong, and game lounges.

Since the 1980s, integrating play into the workplace has garnered increasing attention (Costea et al. 2005). A systematic review revealed that scholars have produced at least 122 publications on this subject. These studies demonstrate the potential for play to unlock latent human and organizational capabilities (Andersen & Pors, 2014), stimulate creativity (Mainemelis & Ronson, 2006), and propel strategic innovation and learning (Statler et al. 2009). Building on this, this review will explore how the expanding body of literature has enriched our comprehension of the fundamental aspects and typology of play and its influence on organizations and employees.

WHAT IS PLAY?

Play holds a unique and significant place, distinct from mere fun or leisure. There have been extensive discussions about the nature of play, with various perspectives emerging. Some argue that play is a freely chosen activity (Caillois 1961; Dandridge 1986), while others believe play involves imagination (Linder et al. 2001; Mainemelis & Ronson 2006; Sandelands 2010). In a comprehensive review, Petelczyc et al. (2018) synthesized previous conceptualizations of play, ultimately concluding that play encompasses all the following three core elements (see Figure 1) below:

First Element: With the goal of amusement, enjoyment, and experienced fun: Play is a universal activity we all naturally lean into and the feeling of joy and excitement during the process (Vleet & Feeney 2015). Play is a voluntary and intrinsically motivated activity that we engage in effortlessly since childhood (Lepper & Henderlong 2000; Mainmelis & Ronson 2006).

Second Element: Enthusiastic and in-the-moment attitude: Imagine a group of children playing hide-and-seek; they are entirely immersed in the game and experience a sense of psychological distance from the outside world, including stressors and responsibilities (Petelczyc et al. 2018; Vleet & Feeney 2015).

Lastly, third element: *Highly interactive*: Distinguishing itself from leisurely activities like reading a book, play involves a high level of engagement either with the activity itself or with other participants (Petelczye et al. 2018; Vleet & Feeny 2015). Play may involve self-entertaining activities, such as building with Lego, which encourages decision-making and action. It may include social interactions like card games, which promote playful social engagement, communication, and experiences.



Figure 1: Core elements of Play

TYPOLGY OF PLAY

While play at work shares the same essential elements (Kinder et al. 2019), it may take different forms. The existing literature has categorized play into various specific forms, such as social and independent play that differentiate the play carries out collectively versus independently (Celestine & Yeo 2020; Petelczyc et al. 2018; Vleet & Fleeny 2015), self or peer-initiated and manager-initiated play that differentiate play that is initiated by employees themselves versus management (Celestine & Yeo 2020), ludic play (free and irrational form of play) and agonistic play that differentiate if play is free and irrational versus rule-bounded and focuses on competition (Bakker et al. 2020; Kolb & Kolb 2010; Kuepers 2017; Vleet & Fleeny 2015).

Also, it is noted that the majority of literature on play at work is characterised by either serious play or diversionary play (Celestine & Yeo 2020). This distinction has received the most attention (Andersen & Pors 2014; Celestine & Yeo 2020; Fourie et al. 2020; Hunter et al. 2010; Mainemelis & Ronson 2006; Roos et al. 2004; Schulz et al. 2015; Statler et al. 2011; West et al. 2017). The differentiation refers to two perspectives: Do play and work intersect? Or are they completely separate? The justification is outlined in Table 1 as given below:

	Serious Play	Diversionsary Play
Nature	With purpose (work responsibilities or organisational goals)	Without purpose (separate from work responsibilities or organisational goals)
Relationship with work	Intersect, play as mean and work as end	Separate, but in cooperative mode
Cognitive	Aware of purpose and focus on work, see work in different way	Forget or avoid work
Affective	Pleasure in challenge	Psychological detachment, sense of freedom
Behavioural	Engaged with and perform work	Escape from work

Table 1. Comparison of Serious Play and Diversionsary Play

Serious play involves combining playful and creative processes with a serious purpose. Examples include employees using LEGO serious play kits in an ideation workshop to build mock-ups and brainstorm new ideas (Schulz et al. 2015; Stalter et al. 2011). Or imagine a clerk challenging themselves to use the fewest words to fill out a form to boost efficiency (Bakker et al. 2020). Instead of separating work and play, organisations or employees transform work into engaging games. This approach harnesses the power of play to achieve organizational objectives, such as achieving specific work tasks, learning new skills, boosting morale, or overcoming organizational challenges (Andersen & Pors 2014; Celestine & Yeo 2020; Fourie et al. 2020; Mainemelis & Ronson 2006; Petelczyc et al. 2018; Roos et al. 2004; Schulz et al. 2015; West et al. 2016).

Serious play has taken center stage in over 60% of play-at-work studies (Celestine & Yeo, 2020). While some doubt that play serves as a strategic tool rather than an activity in itself (Sorensen & Spoelstra, 2011), the effectiveness of serious play lies in its paradox: it encourages playful and creative experiences while ensuring that each game serves a clear goal that benefits the organization (Celestine & Yeo, 2020; Kuepers, 2017).

From a *cognitive perspective*, employees understand the serious purpose of play but have no idea how the spontaneous process of play achieves that goal (Mainemelis & Ronson 2006). It allows flexibility in the way they perceive the work and the way of performing work, breaking away from the usual way in an actual work setting. On an *affective level perspective*, engaging in serious play brings the joy of overcoming challenges and the thrill of discovering unexpected solutions (Mainemelis & Ronson, 2006). Furthermore, play nurtures intrinsic motivation by sparking interest and curiosity in the work itself. Lastly, *behaviorally*, serious play involves an engaging and goal-oriented approach to work, requiring employees to invest their energy in developing new resources, such as productivity and new skills (Celestine & Yeo, 2020).

However, *diversionsary play*, in contrast to serious play, involves non-purposeful and fun activities that employees engage in when they're not working but may have an impact on their work, or are played with work colleagues (Celestine & Yeo 2020; Fourie et al. 2020; Hunter et al. 2010; Mainemelis & Ronson 2006; Petelczyc et al. 2018). For instance, staff playing video games or table tennis during lunch breaks or after work hours (Hunter et al. 2010; Petelczyc et al. 2020). Despite receiving less attention compared to serious play, diversionsary play has a significant impact on work, accounting for less than 40% of workplace play studies. While work and play have a clear boundary, they can coexist in a cooperative mode, balancing each other out.

From a *cognitive perspective*, employees use diversionary play to take a temporary break from work and disconnect from work-related thoughts (Fourie et al. 2020; Mainemelis & Ronson, 2006). From an *affective perspective*, this type of play not only allows employees to have fun but also provides relaxation and psychological detachment (Celestine & Yeo, 2020; Fourie et al. 2020; West et al. 2017). It helps counter the boredom, stress, and exhaustion associated with work (West et al. 2017). Lastly, *behaviorally*, workers use diversionary play to escape from work activities.

By consolidating the aforementioned evidence, it is plausible to say that to understand play at work, the distinct roles of serious and diversionary play and its effects in the workplace should be considered in the analysis of literature. Existing literature has predominantly focused on serious or incident play outcomes separately (Mainemelis & Ronson, 2006). Also, the lack of a dual focus (serious and diversionary play) and how different aspects of play contribute to maximizing its benefits has not been explored in greater depth in recent literature. Hence, the next section will discuss the outcomes of both types of play (serious and diversionary).

THE OUTCOME OF PLAY AT WORK

Previous research (as indicated in Table 2) has thoroughly examined the impact of incorporating play into the workplace on four key behavioral constructs: sense of belonging, work engagement, creativity and sense of producing innovative solutions. The concept of learning adaptability has not been sufficiently addressed in the play literature. However, it has been examined in various domains, including the military (Mun et al., 2017), educational settings involving students (Okita, 2014), and even in the context of children (Li et al. 2023; Khasanah & Purnamasari. 2023). The incorporation of play into the workplace can plausibly influence the intent of learning adaptability, which has long been a primary topic for scholars studying the acquisition of skills and adaptation to external creative environments. Hence, it is valuable to explore the connection between learning adaptability and play in the workplace.

Outcomes	Definition	Studies in the context of Play
Creativity	Something that is both novel and valuable (Ford 2000).	Ashton & Giddings 2018; Costea et al. 2006; 2007; Hjorth 2004; Hunter et al. 2010; Kurt et al. 2010; Mainemelis & Ronson 2006; Schrage 2000; Schulz et al. 2015; Styhre 2008; West et al. 2017; Wheeler et al. 2000.
Sense of producing innovative solutions	The intentional creation, introduction, application of new ideas within a work role, a group or organization, in order to benefit role performance, the group, or the organization (Janssen 2000)	Dodgson 2017; Dougherty & Takacs 2004; Hjorth 2004; Hunter et al. 2010; Kane 2004; Kurt et al. 2010; Mainemelis & Ronson 2006 ; Pors & Andersen 2015; Schulz et al. 2015
Sense of belonging	The feelings that people feel connected to others, and love and care others while being loved and cared for (Deci & Ryan 2000).	Hunter et al. 2010; Keith 2020; Kolb & Kolb 2010; Sandelands 2010; Wheeler et al. 2020; Langley et al. 2018
Work engagement	A positive and fulfilling work-related state where people feel energized, enthusiastic and fully immersed in	Fourie et al. 2020; Hunter et al. 2010; Scharp et al. 2019; 2022

	their work (Scharp et al. 2019; Schaufeli et al. 2006).	
Learning adaptability	Individuals' ability to address novel challenges and acquiring new skills and methods, is crucial (Boulamatsi et al. 2021).	Not investigated in the play literature.

Table 2. Prior Literature investigating the outcomes of Play at Work

Play and creativity

Creativity is defined as something that is both novel and valuable (Ford 2000; Moran et al. 2003). The current body of literature extensively examines the intersection of adult play in the workplace and creativity (Ashton & Giddings 2018; Costea et al. 2006; 2007; Hjorth 2004; Hunter et al. 2010; Kurt et al. 2010; Mainemelis & Ronson 2006; Ross 2016; Schrage 2000; Schulz et al. 2015; Styhre 2008; West et al. 2016; Wheeler et al. 2000). Empirical research heavily emphasizes the relationship between creativity and serious play, as opposed to diversionary play. For example, research by West et al. (2016, 2017) demonstrated the positive influence of serious play on both individual and group creativity. In their research they defined individual creativity as the novelty and usefulness of ideas created by individuals, while group creativity refers to the synergistic emergence of ideas when members interact in certain ways, as adapted from Pirola-Merlo & Mann (2004). Additionally, employees were asked to engage in individual drawing tests and generate ideas collectively, after participating in the play workshops (West et al, 2017). The results confirmed the significant impact of serious play on creativity at both individual and group levels. Employees were more inclined to embrace, innovate, and contribute to the generation of new ideas when serious play interventions were implemented. The creative climate or creativity has been measured in the literature through the scale of individual level of creativity (as developed by Tierney & Farmer, 2002) and nature of team creativity (as developed by Leenders et al. 2003) (refer Appendix 1 and 1.1).

Next, play creates a space for employees to actualize and combine ideas. Creativity involves combining existing thoughts to generate a wide range of new associations (Mainemelis & Ronson 2006). In a case study by Schulz and colleagues (2015), it is observed that playing with LEGO, cardboard, and storyboards enables participants to reify ideas and inspire each other through hands-on interaction. They not only share and influence one another, but also build others' ideas into their own model. For example, one participant introduces the concept of using glasses to display information, which is then integrated into other participants' models. Hence, play results in a continuously evolving and improved end idea.

Furthermore, in literature, the connection between serious play and creativity is also tied to psychological safety, which refers to the team's shared belief about the consequences of taking interpersonal risks (West et al. 2017). Play transforms the nature of work, allowing people to view mistakes and risks in the creative process as opportunities rather than real risks (Mainemelis & Ronson 2006). In a case study by Wheeler and colleagues (2020), participants mention that engaging in play helps them feel confident in expressing creativity and having awkward conversations. Schulz and colleagues' case study (2015) supported this idea, in their research it was found that participants feel distant from their ideas and do not see conflicting ideas as risks. However, research by West et al.

(2019) argued that serious play does not necessarily lead to psychological safety, leaving this argument unresolved.

There is a scarcity of research on the impact of diversionary play on creativity outcomes. The case study conducted by Hunter et al. (2010) demonstrates that engaging in play activities outside of work enhances the creative work identity of software engineers, particularly when they find enjoyment in their workplace. However, this discovery is less likely to be applied to people who do not perceive their profession as being creative.

Play and a sense of producing innovative solutions

In the literature, a sense of producing innovative solutions refers to “the intentional creation, introduction, application of new ideas within a work role, a group or organization, in order to benefit role performance, the group, or the organization” (Janssen 2000, p. 288). Through play, individuals can unleash their imagination to re-establish an unknown future, which is an important part of the innovative process (Andersen & Pors 2014; Hunter et al. 2010; Pors & Andersen 2015). Instead of seeing the future as predetermined or planned, employees who are engaged in play can envision anything as possible and be open to radically new perspectives (Andersen & Pors, 2014; Hunter et al. 2010). Recognizing the seriousness within play, these new perspectives can transform into actual innovative solutions when they return to reality. For example, in research by Andersen and Pors (2014), employees participate in a serious game designed for self-reflection. They compare the potential imagined future with the real present, exploring new organizational possibilities. Additionally, in Schulz et al. (2015)’s research, the capacity for engaging in diversionary play was also shown to be evident because in their research, workshop participants reflected on not anticipating the results they achieved initially. Also, Hunter and colleagues' case study (2010) demonstrates that having fun outside of work enables workers to take a break from contemplating the future aligning with the effectiveness of diversionary play. The concept of sense of producing innovative solutions has been measured in the literature through the scale of innovative work behaviour (as developed by Janssen 2000) (refer Appendix 2).

While there is a large body of research indicating the beneficial effects of play on innovation, a significant number of these studies consist of conceptual papers (Dodgson 2017; Kane 2011; Kurt et al. 2010; Mainemelis & Ronson 2006). The empirical studies consist of mostly qualitative research conducted by Dougherty & Takacs (2004), Hjorth (2004), Hunter et al. (2010), Pors & Andersen (2015), and Schulz et al. (2015). There is a practical need for further quantitative study into the effects of play on producing innovative solutions and problem-solving abilities, as little is known about the effects of serious and diversionary play on these outcomes.

Play and a sense of belonging

A sense of belonging refers to the feelings that people feel connected to others, and love and care for others while being loved and cared for (Deci & Ryan 2000). Empirical research shows that both serious and diversionary play have a significant impact on sense of belonging. They involve fully engaging in the moment and allow people to immerse themselves in the game, creating a sense of detachment from reality (Petelczyc et al. 2018; Vleet & Feeney 2015). This detachment allows individuals to disconnect from work hierarchies and roles and instead connect on a human level (Hunter et al. 2010; Wheeler et al. 2020). In a case study by Wheeler and colleagues (2020), employees described a LEGO Serious Play workshop with the director as "a bunch of friends playing LEGO together and developing connections" (p. 148). Similarly, in Kolb and Kolb's case study (2010), employees engaged in a softball

game outside of work (one form of diversionary play) did not recognize their work roles but connected as individuals.

The intense interaction with games and other players during play creates shared experiences, fostering a common language and bonding among employees. In serious play, employees value these shared experiences, actively interacting with each other and sharing the excitement in the activities (Dougherty & Takacs 2004; Wheeler et al. 2020). The shared experiences of play also provide a common language for employees to chat and bond with others lightheartedly during play (Hunter et al. 2010; Wheeler et al. 2020).

Unlike diversionary play, serious play offers a unique value by fostering a new systemic view of team interconnection. For instance, participants in three case studies reflect that they view each other differently during serious play, rather than in their usual work context (Dougherty & Takacs 2004; Schulz et al. 2015; Wheeler et al. 2020). When collectively using LEGO as metaphors to explicitly present their own contributions and their interrelationship, they gain a novel and detailed understanding of how their actions interconnect, where the obstacles lie, and how they fit together within the organization or team. A participant in a case study described this process as "team brain building" (Wheeler et al. 2020, pp. 150). The loose association between play and work enables them to break their habitual thinking in viewing colleagues, while also being mindful of applying their new perceptions back in the workplace (Wheeler et al. 2020).

The concept of sense of belonging has been measured in the literature through the scale of relatedness (as developed by La Guardia et al. 2000) (refer Appendix 3). There have been qualitative studies that have suggested a strong link between play and sense of belonging, particularly the impact of serious play on team dynamics. However, there is a lack of quantitative research to support this. Only one quantitative study, conducted by Keith in 2018, has investigated the impact of diversionary play on team cohesion through a lab experiment. The scholar compares the effects of team video gaming and traditional goal training programs on team cohesion, which refers to how members behave as a group and their desire to remain in the group. Surprisingly, while team video gaming positively impacted team cohesion, its effect was less significant than that of traditional goal training. These scholars believe a training program designed for developing team building would have a more substantial impact. While team building activities may outperform diversionary play benefits, we were unable to identify a quantitative study looking at how serious play fosters a sense of belonging.

Play and work engagement

Research has described work engagement as a positive and fulfilling work-related state where people feel energized, enthusiastic and fully immersed in their work (Scharp et al. 2019). Studies have shown that work engagement significantly impacts productivity and job satisfaction (Caracuzzo et al. 2024; Scharp et al. 2022). Highly engaged employees exhibit increased energy, dedication, and immersion in their work (Scharp et al. 2019). It is evident that serious and diversionary play have distinct performances on employees' work experiences. Surveys conducted by Scharp and colleagues (2019; 2022) indicate that engaging in serious play, characterized by elements of fun and competition, positively influences work engagement by meeting employees' needs for autonomy, social interaction, and competence in the workplace. Serious play allows employees to set personal or collective goals, fostering a sense of control and achievement (Scharp et al. 2019). For example, retail sales workers may create personal challenges to enhance productivity by setting competition for sales, ultimately leading to a greater sense of control over their work. Furthermore, serious play fosters interpersonal

connections, as lighthearted interactions and activities among employees enhance their sense of affiliation (Caracuzzo et al. 2024). The setting of goals within serious play also contributes to a feeling of accomplishment. When workers see themselves as self-motivated, socially skilled, and capable individuals in the workplace, they bring their full dedication, energy, and enthusiasm to their work.

While the impact of serious play on work engagement is well-supported, empirical studies question the effect of diversionary play. While Hunter and colleagues (2010) suggest that engaging in games outside of work helps software engineers balance the stresses of their jobs, the study by Fourie et al. (2020) presents a conflicting viewpoint. They argue that games and activities separate from work help employees psychologically detach from work but do not necessarily increase work enjoyment or decrease work-related boredom. While diversionary play may improve employees' overall emotional well-being, it does not seem to impact their emotions or motivations related to work significantly. The concept of work engagement has been measured in the literature through the Utrecht Engagement Scale (UWES-J) (as developed by Schaufeli et al. 2006) (refer Appendix 4).

Play and learning adaptability

Learning adaptability refers to individuals' ability to address novel challenges and acquiring new skills and methods (Boulamatsi et al. 2021). On one side, few studies have investigated how serious play can have an impact on adaptability. For instance, in Jacobs and Statler's case study (2006), serious play empowers employees to communicate using rich metaphors and narratives, offering a departure from conventional strategic discussions and helping them navigate business ambiguity. Their study involved presenting employees with hypothetical scenarios, casting organizations as a "flotilla of ships" and brands as a "lighthouse". They concluded that by leveraging metaphors, employees can rely on intuition over rational analysis to uncover alternative meanings in novel problems thereby fostering adaptability. However, on the other side, the connection between play and learning adaptability is an under-explored area as this concept has previously been examined in various other domains, including the military (Mun et al., 2017), educational settings involving students (Okita, 2014), and even in the context of children (Li et al. 2023; Khasanah & Purnamasari. 2023), and hence needs quantitative investigation. The concept of learning adaptability has been measured in the literature through the individual adaptability scale (I-ADAPT-M) (as developed by Ployhart & Bliese 2006) (refer Appendix 5).

CONCLUSION

Based on the insights presented above, it can be concluded that existing research indeed recognizes the substantial relationship of play with both individual and organizational performance. Prior studies have mainly demonstrated positive relationships between serious play and above explained behavioural outcomes such as creativity, work engagement, a sense of belonging, generating innovative ideas, and developing adaptability in learning, while these relationships appear less clear for diversionary play. Nevertheless, prior studies have mostly been inadequate in presenting compelling quantitative data regarding the consequences of integrating play into work environments (Celestine & Yeo 2020; Petelczye et al. 2018). For example, out of the 122 papers that investigate playful activities in the workplace, only 31 of them are exclusively quantitative research (Celestine & Yeo 2020), and many of those did not include experiments that allow for cause-and-effect relationships to be established. There is a definite call for actual quantitative and experimental

evidence to convincingly demonstrate and support the cause-and-effect relationship of combining play and work.

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Appendix

Appendix 1. Creativity scale measured through Individual Creativity (developed by Tierney & Farmer 2002, used by Duan et al. 2019)

Creative self-efficacy scale (CSES) three self-report items are measured on a 7-point scale from 1 (extremely disagree) to 7 (extremely agree), to assess how employees' beliefs in their ability to be creative in their work

1. I have confidence in my ability to solve problems creatively
2. I have a knack for further developing the ideas of others
3. I feel that I am good at generating novel ideas

Appendix 1.1 Creativity Scale measured through Team Creativity (developed by Leenders et al. 2003)

Respondents are asked to rate the teams' creative accomplishment – in the sense of “generating new ideas, methods, approaches, inventions, or applications” on a 7-point scale, from 1 (not at all) to 7 (highly)

Appendix 2. A sense of producing innovative solutions scale measured through Innovative Work Behaviour (developed by Janssen 2000)

Nine self-reported items are measured on a 7-point scale, from 1 (never) to 7 (always), to examine how often they perform the following innovative work behaviours.

1. Creating new ideas for difficult issues (idea generation)
2. Searching out new working methods, techniques, or instruments (idea generation)
3. Generating original solutions for problems (idea generation)
4. Mobilizing support for innovative ideas (idea promotion)
5. Acquiring approval for innovative ideas (idea promotion)
6. Making important organizational members enthusiastic for innovative ideas (idea promotion)
7. Transforming innovative ideas into useful applications (idea realization)
8. Introducing innovative ideas into the work environment in a systematic way (idea realization)
9. Evaluating the utility of innovative ideas (idea realization)

Appendix 3. A sense of belonging scale measured through Relatedness, Basic Psychological Needs Scale (developed by La Guardia et al. 2000)

Four self-reported items are measured on a 4-point scale, from 1 (strongly disagree), to 4 (strongly agree), to assess relatedness

In general

1. I like the people I interact with.
2. I get along with people I meet.
3. I pretty much keep to myself and don't have a lot of social contacts. (R)
4. I consider the people I regularly interact with to be my friends.
5. People in my life care about me.
6. There are not many people that I am close to. (R)
7. The people I interact with regularly do not seem to like me much. (R)
8. People are generally pretty friendly towards me.

At work

1. I like the people I work with.
2. I get along with people at work.
3. I pretty much keep to myself when I am at work. (R)
4. I consider the people I work with to be my friends.
5. People in at work care about me.
6. There are not many people at work that I am close to. (R)
7. The people I work with do not seem to like me much. (R)
8. People at work are pretty friendly towards me.

Appendix 4. Measurement Scale for Work Engagement, Utrecht Work Engagement Scale (UWES-J) (developed by Schaufeli et al. 2006)

Nine self-reported items under three dimensions: vigor, dedication, absorption, are measured on a 6-point scale, from 1 (never) to 6 (always)

Student Version

Vigor (VI)

1. When I get up in the morning, I feel like going to class.
2. When I'm doing my work as a student, I feel bursting with energy.
3. I feel strong and vigorous when I'm studying or going to class.

Dedication (DE)

1. My study inspires me.
2. I am enthusiastic about my studies.
3. I am proud of my studies.

Absorption (AB)

1. I get carried away when I am studying.
2. I am immersed in my studies.
3. I feel happy when I am studying intensely.

Employee Version

Vigor (VI)

1. When I get up in the morning, I feel like going to work.
2. At my work, I feel bursting with energy.
3. At my job I feel strong and vigorous.

Dedication (DE)

1. My job inspires me.
2. I am enthusiastic about my job.
3. I am proud on the work that I do.

Absorption (AB)

1. I get carried away when I am working.
2. I am immersed in my work.
3. I feel happy when I am working intensely.

Appendix 5. Measurement Scale for Learning Adaptability, Individual Adaptability Measure (I-ADAPT-M) (developed by Ployhart & Bliese 2006)

Nine self-reported items are measured on a 5-point scale, from 1 (strongly disagree) to 5 (strongly agree), to examine individual learning adaptability

1. I take responsibility for acquiring new skills.
2. I enjoy learning new approaches for conducting work.
3. I take action to improve work performance deficiencies.
4. I quickly learn new methods to solve problems.
5. I often learn new information and skills to stay at the forefront of my profession.
6. I train to keep new skills and knowledge current.
7. I am continually learning new skills for my job.
8. I take responsibility for staying current in my profession.
9. I try to learn new skills for my job before they are needed.