

**INVESTIGATING THE EFFICACY OF GAMIFICATION IN AN ONLINE POSITIVE PSYCHOLOGY INTERVENTION (OPPI) AIMED AT INCREASING EMPLOYEE WELL-BEING**

by

Amy McKinley



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Supervisor: Dr Samantha Adams

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## **Declaration**

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**Initial and Surname:** A McKinley

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## Abstract

Employees are considered one of the most valuable resources in an organisation and ensuring that they are functioning efficiently is vital to an organisation's success (Baptiste, 2008). One way for an organisation to support the optimal functioning of its employees is to ensure their well-being at work by implementing health and well-being interventions. Especially given the devastating impact that the COVID-19 pandemic has had on employees' mental health (Mind, 2021). However, participation in employee health and well-being interventions is traditionally low (Poole et al., 2001; Howarth et al., 2018). Moreover, attrition in employee health and well-being interventions was strongly correlated to a lack of personal motivation to participate in health and well-being interventions and high levels of boredom experienced during the interventions (Edwards, 2012). Thus, there is a prevalent need for innovative strategies that motivate employees to actively participate in health and well-being interventions.

One prominent innovation for health and well-being improvement is the development of serious games and gamified interventions using gamification (Wattanasoontorn et al., 2013). Research has shown that serious games and gamified interventions, if designed well, can increase one's motivation and engagement, because they satisfy one's innate desires through the implementation of intrinsically motivating game design elements (Johnson et al., 2016). Studies have shown that gamification can have a positive impact on employee well-being interventions (Kark, 2011; Ahtinen et al., 2013; Hall et al., 2013), but there is no empirical evidence showing that the increase in employee well-being was due to the implementation of gamification or just a result of the employee well-being intervention.

Therefore, the aim of this exploratory research study was to conduct a controlled field experiment ( $N = 26$ ), to investigate the efficacy of a gamified Online Positive Psychology Intervention (OPPI) aimed at increasing employee well-being. The results of this study found significant support for one of the four hypotheses that were tested, and two of the four hypotheses indicated a trend towards significance. Thus, there was a trend towards a possible relationship between the effectiveness of gamification and the enhanced outcomes of the employee well-being intervention used in this study.

The results of this study make an important contribution to research in the employee well-being domain as it provides preliminary evidence of the potential positive effects that gamification can have on the outcomes of employee well-being interventions.

## Opsomming

Werknemers word beskou as een van die mees waardevolle hulpbronne in 'n organisasie en om te verseker dat werknemers doeltreffend funksioneer, is noodsaaklik vir 'n organisasie se sukses (Baptiste, 2008). Een manier vir 'n organisasie om optimale funksionering van sy werknemers te bereik, is om hul welstand by die werk te verseker deur gesondheids- en welstandsintervensies te implementeer. Veral gegewe die verwoestende impak wat die COVID-19-pandemie op werknemers se geestesgesondheid gehad het (Mind, 2021). Deelname aan werknemergesondheids- en welstandintervensies is egter tradisioneel laag (Poole et al., 2001; Howarth et al., 2018). Boonop hoë uitvalvlakke in werknemergesondheid en -welstandintervensies sterk gekorreleer met 'n gebrek aan persoonlike motivering en verveling (Edwards, 2012). Daar is dus 'n algemene behoefte aan innoverende strategieë wat werknemers motiveer om aktief aan gesondheids- en welstandsintervensies deel te neem.

Een prominente innovasie vir die verbetering van gesondheid en welstand is die ontwikkeling van ernstige speletjies en “gamified” intervensies deur gebruik te maak van “gamification” (Wattanasoontorn et al., 2013). Navorsing het getoon dat ernstige speletjies en speletjie-intervensies, indien goed ontwerp, 'n mens se motivering en betrokkenheid kan verhoog, omdat dit 'n mens se ingebore begeertes bevredig deur die implementering van intrinsiek motiverende speletjie-ontwerpelemente (Johnson et al., 2016). Studies het getoon dat gamification die welstand van werknemers kan verbeter (Kark, 2011; Ahtinen et al., 2013; Hall et al., 2013), maar daar is geen empiriese bewyse wat toon dat die toename in werknemerwelstand te wyte was aan die implementering van gamification of bloot 'n gevolg van die werknemerwelstandintervensie.

Daarom was die doel van hierdie verkennende navorsingstudie om 'n gekontroleerde veldeksperiment ( $N = 26$ ), uit te voer om die doeltreffendheid van 'n gamified Online Positive Psychology Intervention (OPPI) wat daarop gemik is om werknemerswelstand te verhoog, te ondersoek. Die resultate van hierdie studie het beduidende ondersteuning gevind vir een van die vier hipoteses wat getoets is, en twee van die vier hipoteses het 'n neiging tot betekenisvolheid aangedui. Daar was dus 'n neiging na 'n moontlike verband tussen die effektiwiteit van gamification en die verbeterde uitkomst van die werknemerwelstandintervensie wat in hierdie studie gebruik is.

Die resultate van hierdie studie lewer 'n belangrike bydrae tot navorsing in die werknemerwelstandsdomein. Dit verskaf voorlopige bewyse van die potensiële positiewe uitwerking wat gamification op werknemerwelstandintervensies kan hê.

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## Chapter 1

### Introductory Argument

The World Health Organisation [WHO] (2019, p.9), describes *health and well-being* as “a state of complete physical, mental, and social well-being”. General well-being research supports two perspectives, namely hedonic and eudemonic well-being, otherwise referred to as subjective and psychological well-being respectively (Bartels et al., 2019). The hedonic perspective refers to one’s happiness and affect states, while the eudemonic perspective stipulates that well-being can be improved through personal growth and optimal functioning (Bartels et al., 2019). Bartels et al. (2019) states that the composite construct of employee well-being, or otherwise referred to as ‘workplace well-being’, also supports the hedonic and eudemonic well-being perspectives of general well-being, but in the specific context of the workplace (Bartels et al., 2019). Research also states that employee well-being is a complex interaction of job characteristics and person-centred variables over time (Gameiro et al., 2020).

In South African labour law, the classification of occupational health is unclear, and still favours physical health as the main predictor of employee health and well-being (Sieberhagen et al., 2009). Additionally, there is no definition of employee well-being within South African labour law, which highlights the lack of understanding on the importance of employee well-being within South African organisations. This is emphasized in the South African labour relations framework, which provides a framework for interventions that promote employee health, but fails to encompass holistic employee well-being interventions (Sieberhagen et al., 2009).

Over the last decade, poor health and well-being of employees has had a major impact on modern organisations, in terms of increased stress levels, reduced social capital, increased

absenteeism and reduced loyalty, which have all been found to be related to a general decrease in employee well-being (Dorling & McCaffery, 2012). As a result, there has been a universal movement to focus on promoting health and well-being in the workplace (Johnson, et al., 2016), particularly in light of the COVID-19 pandemic. Research by Mind (2021) found a direct link between the COVID-19 pandemic and a decline in mental health, with more than 50% of respondents who reported that their mental health had deteriorated since the lockdown restrictions began.

Tov and Chan (2013) argue that ensuring employee well-being is critical for organisations and not just a “nice-to-have”. It is critical, because it fosters happy and satisfied employees, which influences employee’s job satisfaction, attitudes, and has implications on productivity levels and workplace relations (Tov & Chan, 2013). Tov and Chan (2013) found that satisfied and happy employees are more likely to be innovative, follow with organisational guidelines and policy, trust their managers, help their co-workers, and work collaboratively to achieve organisational goals. Ultimately, these behaviours contribute to successful organisations, therefore, highlighting the importance of employee well-being.

There are several ways to promote employee well-being by addressing the person-centred and job characteristics that influence employee well-being (Gameiro et al., 2020). Mind (2022) suggests fostering an organisational culture and implementing activities that promote mental health. This can be done by demonstrating leadership’s commitment to mental health, involving all employees in decision-making to help them understand how their role contributes to the organisation’s mission, ensuring an open dialogue about mental health, promoting work-life balance, ensuring an optimal physical working environment, and encouraging one-to-one communication between employees and managers to promote positive working relationships



(Mind, 2022). Organisations can also promote well-being by implementing employee assistance programmes (EAPs) and policies that support mental health and by providing training interventions that promote positive behaviours and stress management (Mind, 2022). The current study chose to implement an online positive psychology intervention (OPPI), because research has shown that positive psychology interventions (PPIs) are highly effective in improving well-being (Boiler & Abello, 2014; Pogrebtsova et al., 2017; Sin & Lyubomirsky, 2009), and the online format allowed it to be more convenient and accessible to all employees during the COVID-19 pandemic.

Nevertheless, the aforementioned benefits of employee well-being will likely only come to fruition if employees participate in the organisational culture or activities, such as OPPIs, that promote mental health and well-being. Typically, participation in employee health and well-being interventions is low (Poole et al., 2001). An organised review of literature by Robroek et al. (2009) revealed that the participation rates of employee health and well-being programmes was less than 50%. Edwards (2012) found that attrition in employee health and well-being interventions was strongly correlated to a lack of personal motivation to participate in health and well-being interventions and high levels of boredom during the interventions. There are many factors that might influence the lack of motivation to participate in, and increased levels of boredom experienced during employee health and wellbeing interventions. Namely, lack of participation from leadership, privacy concerns, inconvenient or inaccessible interventions, as well as generic interventions (Aduro, 2021). Therefore, there is a need for organisations to take these contributing factors into consideration and implement innovative strategies to successfully increase motivation to participate in health and well-being interventions and reduce boredom during health and well-

being interventions, thus potentially increasing the outcomes of the employee well-being intervention.

### **1.1 Gamification as an Innovative Strategy in the Workplace**

Dorling and McCaffery (2012) support the idea that a novel strategy is required for a younger generation that has grown up with the internet and online video games. The realisation of the fourth industrial revolution is among the primary motivators driving organisations to implement innovative strategies. The fourth industrial revolution is encapsulated by the innovation of cyber-physical systems (CPS), which combine digital and physical technology systems to create a hyper-connected and hyper-automated world (Guoping et al., 2017). The paradigm shift into the fourth industrial revolution generates a need for employees to develop new competencies, but it also generates new workplace stressors, therefore organisations also have a responsibility to modernize their processes for employees to cope and thrive in this technologically advanced era (Guoping et al., 2017).

Gamification is seen as an innovative tool to increase participation in any given task, as well as increase the motivation of participants (Lopes et al., 2019). Gamification can be conceptualised as using game design elements in non-gaming situations to increase engagement and motivation in the task at hand (Deterding et al., 2011) and can be used in a variety of fields, including academics, healthcare, the government, and organisations. (Sahgal, 2012). Motivational theories, such as self-determination theory (Ryan & Deci, 2000), and flow theory (Csikszentmihalyi, 1990), are heavily embedded in gamification. The implementation of game elements creates gamified systems, which have motivational affordances (Lopes et al., 2019). Game elements, such as badges, points, and progress paths, to name a few, spark intrinsic desires,

such as a need for recognition, social support, and feedback on individual progress (Lopes et al., 2019). Therefore, incorporating game elements may increase intrinsic interest in an employee well-being intervention.

Organisations that use gamification to transform portions of their work processes into game-like experiences for their employees are said to have gamified workplaces. This is accomplished by adopting a few key game design concepts, and results in enhanced work experiences that are more engaging and fun (Dorling & McCaffery, 2012). More specifically, research by Johnson et al. (2016) revealed that the implementation of gamification creates more engaging workplaces, further opportunities for collaborations to increase productivity, increased motivation, and workplace customization for enhanced employee control. Swan (2012) also showed that integrating gamification into organisational processes can have a positive impact on organisational performance.

The increased use of technology on a global scale also plays a large part in influencing the success of gamification, specifically with the easy accessibility of mobile devices, the level of online connectivity and the influence of online games, which is already heavily embedded in human culture (Roy, 2012). Specialists in the field of digital technology, call this trend towards gamification a "virtual revolution", and is anticipated to have an impact on every industry and organisational process (Nahl & James, 2012).

## **1.2 Gamification of Employee Well-being Interventions**

Gamification has been demonstrated to have a favourable effect on the results of well-being interventions, such as flourishing and personal development (Hall et al., 2013), as well as stress and anxiety (Dennis & O'Toole, 2014) to name a few. Gamification aims to improve the outcomes

of health and well-being interventions by employing game design principles to transform the intervention, making it more engaging, fun, and productive (Dorling & McCaffery, 2012). This supports the potential of gamification as a strategy to enhance employee well-being intervention outcomes, such as workplace well-being, subjective well-being, and psychological well-being.

In a non-gaming context, such as the workplace, multiple theories have been proposed in determining the overall happiness of employees, otherwise known as employee well-being. According to these theories, there are many different ways to be happy, however, it is difficult to measure overall happiness because everyone has different kinds of rewards or desires that make them happy (McGonigal, 2011). Rewards function as motivators and can either be intrinsic, for example: social connection and self-esteem, or they can be extrinsic in nature, for example: monetary rewards and status (McGonigal, 2011). Interestingly, extrinsic motivators lead to hedonic behaviours, which predict positive emotions, while intrinsic motivators lead to eudemonic behaviours, which predict meaning in life (Csikszentmihalyi, 1975). Both eudemonic and hedonic behaviours predict flourishing (Csikszentmihalyi, 1975). Therefore, it can be said that employees need to be both intrinsically and extrinsically motivated to experience overall employee well-being.

Rajat Paharia (2012) believes that the success of gamification is due to its ability to satisfy fundamental human needs and desires, such as recognition, status, achievement, competition, self-expression, and altruism (Werbach et al., 2011). We are all driven by a combination of our own feelings and desires, and research has demonstrated that these emotions and intrinsic drives apply to anyone from any demography, gender, or cultural background (Werbach et al., 2011). Additionally, an organised review conducted by Johnson et al. (2016) regarding gamification in

health and well-being interventions found that gamification has a positive impact on health and well-being related interventions, due to its motivational affordances.

However, the efficacy of gamified interventions in increasing employee health and well-being is not clearly established in literature. Johnson et al. (2016) highlights that research in the health and well-being domain is dominated by evidence relating to the positive impact gamification can have on physical behavioural outcomes, such as exercise, smoking and eating habits, to ensure employee well-being. With the implementation of a gamified tool, there was greater motivation to participate in these kinds of interventions, which led to a successful behavioural outcome. Furthermore, the systematic review by Johnson et al. (2016) exhibited that more than half of the studies evaluated did not test the efficacy of gamification by comparing gamified versus non-gamified interventions, thus there is a lack of evidence for comparison studies. For example, in a study evaluating a mental well-being training intervention, involving techniques to encourage changes in negative thought patterns and beliefs, the results showed an increase in mental well-being (Ahtinen et al., 2013). However, the researchers could not attribute the improvement in mental well-being of the participants to the efficacy of gamification, because no comparison study was done (Ahtinen et al., 2013).

To address the afore-mentioned gaps, this study examined the effect of incorporating game elements into a previously researched employee well-being intervention, the Working for Wellness Programme (Page & Vella-Brodrick, 2009). The Working for Wellness Programme has proven to successfully increase employee well-being in an Australian organisation (Page & Vella-Brodrick, 2009). By taking a successful intervention and incorporating the motivational affordances of gamification, the researcher can truly explore gamification as an avenue to significantly improve employee well-being.

### **1.3 Research Initiating Question**

There are several factors and knowledge gaps that supported the need for this research study. For one, organisations are shifting from having a sole focus on organisational results to emphasising the value of employee well-being at work. (Baptiste, 2008; Valcour & Lirio, 2014), especially given the negative effect of the COVID-19 pandemic on the mental health of employees (Mind, 2021). In conjunction with this focus shift, there is a universal need for innovative tools that motivate and engage employees to participate in well-being interventions that aim to improve overall health and well-being.

South African organisations are being confronted with numerous physical and psychological risk factors at work that impact the wellness of employees (Sieberhagen et al., 2009), including, amongst others, the psychological toll the current global pandemic has had on the global population. Given the current evidence of the potential impact of gamification on the outcomes of health and well-being interventions, this study sought to contribute to this domain through the evaluation of the efficacy of a gamified Online Positive Psychology Intervention (OPPI) in comparison to a non-gamified OPPI in increasing employee well-being, in a South African context. Therefore, the research question was: *“To what extent is a gamified OPPI more effective in increasing employee well-being than a non-gamified OPPI?”*

#### ***1.3.1 Research Aim and Objectives***

The aim of this research study was to conduct a controlled field experiment to investigate the efficacy of gamification in an OPPI aimed at increasing employee well-being within a South African organisation. The following research objectives were used to address the research question:

- To clarify the role of gamification in employee well-being interventions,
- To gamify an OPPI, the Working for Wellness Programme,
- To evaluate the efficacy of a gamified OPPI in comparison to a non-gamified OPPI in increasing employee well-being through a controlled field experiment.

## **1.4 Chapter Structure**

Overall, this chapter made a strong case for and described the aim of this study. The next chapter gives a summary of the literature in the domain of employee well-being, as well as the literature on gamification and its effects on employee health and well-being interventions and is concluded by outlining the hypotheses for this study. Thereafter, the research methodology chapter is discussed with a focus on the research design, the gamified intervention, sampling, data collection, data analysis, threats to validity and reliability, and ethical considerations. In the results chapter the descriptive statistics, reliability analyses and evaluation of the hypotheses pertaining to the effectiveness of the gamified intervention is presented. Lastly, in the discussion chapter an overview of the main findings and implications of the study is formulated to provide nuanced, evaluative comments on the key takeaways of this study.

## Chapter 2

### Literature Review

The average person spends a large part of their life working, thus it is no surprise that workplace well-being has an impact on their overall health and well-being. Fortunately, it has been found that positive psychology interventions (PPIs) can improve well-being (Pogrebtsova et al., 2017). However, the rate of participation in such interventions in the workplace is low (Poole et al., 2001; Howarth et al., 2018). This supports the investigation of innovative strategies to increase employee motivation and engagement in health and well-being interventions. More and more organisations are implementing the latest technologies, such as gamification, to promote employee well-being and create “positive organisations” (Johnson et al., 2016), and although this is a positive trend, there is a lack of empirical evidence to support these organisational decisions. Therefore, this literature review aimed to examine the current status quo in the well-being and gamification literature, particularly where they intersect.

The two main components of this research study were: employee well-being and gamification. Therefore, the foundation of this literature review was based on existing relevant research on employee well-being, and limited research relating to the efficacy of gamification in interventions related to this subject area. Studies on existing Positive Psychology Interventions (PPIs), and existing gamified interventions aimed at increasing employee well-being were reviewed in terms of their content, as well as the effectiveness of gamification on the outcome of the intervention. This chapter, therefore, outlined the rationale for this exploratory study.



## **2.1 Employee Well-being**

Employee well-being looks at the well-being of employees from a holistic perspective and involves attempts to enhance employee's mental, physical, and emotional well-being at work (Pogrebtsova et al., 2017). Chapter 1 argued that employee well-being is important for the success of any organisation because it leads to satisfied employees, which increases the likelihood of productive behaviours at work (Tov & Chan, 2013).

### ***2.1.1 The Organisational Impact of Employee Well-being***

Promoting employee well-being is beneficial for employees, as well as organisations. Research has shown that there is a positive correlation between well-being and productivity in the workplace (Wright & Cropanzano, 2000), which gives merit to the common phrase, "happy workers are productive workers". This is also demonstrated by Page and Vella-Brodrick (2009), who found that promoting employee well-being led to an increase in job performance and a decrease in employee turnover. An increase in job performance and a decrease in employee turnover has proven to increase organisational health (Cotton & Hart, 2003), which is required for a business to achieve sustainability and long-term success. Therefore, it can be suggested that promoting employee well-being ultimately impacts the success of an organisation.

Additionally, there is also a strong correlation between employee well-being and employee retention (Page & Vella-Brodrick, 2009; Sears et al., 2013). Many organisations implement strategic objectives to try decrease or prevent employee turnover, because it is very costly to lose a talented employee. Losing a talented employee can cost up to four times the exiting employee's annual salary (Sawaneh & Kamara, 2019). According to research, employees' intentions to resign are correlated with an absence of work-related Positive Affect (PA) rather than the experience of work-related Negative Affect (NA) (Page & Vella-Brodrick, 2009; Cotton & Hart, 2003).

Therefore, an employee is more likely to resign from an organisation if they do not experience positive emotions from work-related activities, such as happiness, and inspiration, rather than resign if they have experienced negative emotions in the workplace, such as fear.

According to Wright and Bonett (2007), when unhappy at work, individuals who have a positive attitude on life are more inclined to quit their jobs. The results of this research by Wright & Bonett (2007) are in favour of including "work-related affect" and "job satisfaction" in the definition of employee well-being. presented by Page and Vella-Brodrick (2009). Thus, it is vital for organisations to promote employee well-being to ensure the retention of talented employees.

To gain a better understanding of the construct of employee well-being this next section will explore the relevant models and constructs, such as the mental health model (Keyes, 2005), hedonic and eudemonic well-being, and the employee mental health model (Page & Vella-Brodrick, 2009).

### ***2.1.2 Mental Health Model***

The WHO (2004, p.10) describes mental health as, "a state of well-being in which the individual realises his or her own abilities, can cope with the normal stresses of life, can work productively and fruitfully, and is able to make a contribution to his or her community." More recently, mental health is referred to as the experience of well-being, instead of the lack of illness (WHO, 2004). This definition is supported by studies conducted by Diener (1984), Ryff (1989), Waterman (1993) and Ryff and Keyes (1995), who are prominent authors in this field.

Keyes' (1998) model is an example of a wellness approach, which argues that there must be an absence of mental illness symptoms and a presence of mental health components for mental health to occur. This model outlines three components of mental health: emotional, psychological, and social well-being (Keyes, 2005). Emotional well-being comprises of happiness, satisfaction in

life, and positive affect (Keyes, 2005). Psychological well-being comprises of personal growth, life satisfaction, and environmental mastery. Social well-being comprises of social acceptance, social actualisation, and social coherence. Keyes (2005) refers to emotional and psychological well-being as “positive feelings”, and social well-being as “positive functioning”. Based on Keyes’ (1998) model, for a person to be considered mentally healthy or flourishing, the individual must possess symptoms of “positive feelings” and “positive functioning”.

Keyes’ (2005) classification of mental health as “positive feelings” and “positive functioning” brings together two differing approaches of well-being theories, specifically hedonic and eudemonic well-being respectfully (Keyes, 2005; Bartels et al., 2019). The next section will elaborate on these approaches.

### ***2.1.3 Hedonic Well-being***

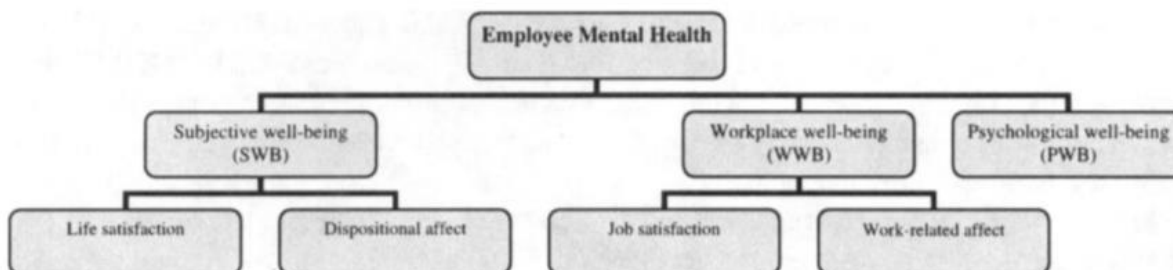
Hedonic well-being refers to happiness and explains that happiness is a result of an individual’s effort to minimise pain and maximise pleasure (Waterman, 1993). The primary focus of the hedonic approach is an individual’s Subjective Well-being (SWB) (Huta, 2017), which is briefly defined as “positive feelings” as mentioned in Keyes’ (2005) mental health model. Research proposes that high levels of positive affect (PA), low levels of negative affect (NA), and general life satisfaction make up the three key components of SWB. (Huta, 2017; Watson et al., 1988; Diener et al., 1985). There are many factors that influence an individual’s SWB, such as genetic factors, environment, and relationships (Keyes, 2005). These factors can cause components of well-being to fluctuate, and some individuals are more equipped to deal with changing life circumstances than others (Waterman, 1998).

#### ***2.1.4 Eudemonic Well-being***

Eudemonic well-being denotes the optimal functioning of a person and explains that well-being is derived from achieving self-actualisation (Maslow, 1968), personal fulfilment (Waterman, 1998) and self-determination (Ryan & Deci, 2001). This literature review aimed to examine the current status quo in the wellbeing and gamification literature, particularly where they intersect. PWB is briefly defined as “positive functioning”, as referred to in Keyes’ (2005) mental health model and includes six well-being dimensions according to Ryff (1995). The six dimensions are self-acceptance, purpose in life, environmental mastery and autonomy, healthy relationships with others and personal development (Ryff, 1995). Ryff (1995) stated that once an individual has realised each of these dimensions, a high level of PWB is achieved. Research has found that SWB and PWB are key predictors in determining employee well-being (Ryff, 1989; Zheng et al., 2015). Therefore, forming the foundation of Page and Vella-Brodrick’s (2009) employee mental health or well-being model.

#### ***2.1.5 Employee Mental Health Model***

Researchers, Page and Vella-Brodrick (2009), used the afore-mentioned models and approaches to well-being and integrated them to develop their employee mental health model. This model posits that SWB and PWB are core components of employee mental health, but to accurately predict well-being at work, the researchers incorporated a third core component of employee mental health, Workplace Well-being (WWB).

**Figure 2.1***Employee Mental Health Model*

*Note.* This model was developed by Page and Vella-Brodrick (2009), summarising the components of the employee well-being construct. From “The 'What', 'Why' and 'How' of Employee Well-Being: A New Model,” by K. M. Page and D. A. Vella-Brodrick, 2009, *Social Indicators Research*, 90(3), p. 441-458. (<https://doi.org/10.1007/s11205-008-9270-3>). Copyright 2022 by Springer Nature Switzerland AG.

#### **2.1.5.1 Workplace Well-being (WWB).**

Page and Vella-Brodrick’s (2009) employee mental health model incorporates two work-specific constructs, including job satisfaction and work-related affect, which form SWB at work. These work-specific constructs make up the third component of the employee mental health model, Workplace Well-being (WWB).

Although some researchers believe that life satisfaction is a determinant of job satisfaction, job satisfaction is one of the major factors influencing overall life satisfaction. (Rode, 2004). Page and Vella-Brodrick (2009) found that subjective well-being at work is usually measured by one component of general SWB, specifically overall life satisfaction and often does not consider job satisfaction or positive and negative work-related affect. Thus, SWB likely contributes to some variation in employee well-being, and any added variance may be explained if measures of job

satisfaction and work-related affect are also used to measure the complex construct of employee well-being. Based on this, it was stated that combining measures of general and workplace well-being will likely produce outcomes of employee well-being interventions that are more accurate. (Ilies et al., 2007; Page & Vella-Brodrick, 2009). Thus, Page and Vella-Brodrick (2009) concluded that employee well-being must be measured through constructs of SWB, consisting of components, such as life satisfaction, PA, NA, PWB, work-related affect and job satisfaction.

### *i. Work-related Affect*

Many factors in the workplace have been found to impact health, well-being, and job performance. Research suggests that positive and negative work-related affect aids in the prediction of employee well-being (Wright et al., 2007; Page & Vella-Brodrick, 2009). Cotton and Hart (2003) proposed that employee well-being, operationalised as PA and NA, plays an important role in the health and well-being of an organisation, which is influenced by interactions between individual and workplace variables. Work-related affect refers to the emotional state, positive or negative, of an individual due to work-related factors. Work-related affective states have been theorised into two dimensions with respective states, namely, arousal (high and low) and valence (pleasure and displeasure) (Cotton & Hart, 2003). Researchers argue that different levels of motivation and certain behaviours cause positive affect to vary on the arousal dimension (high arousal versus low arousal) (Ahn & Shi, 2015), therefore it is vital to increase motivation and engage in certain behaviours that increase positive work-related affect. Furthermore, work-related negative affect states, specifically low arousal, and displeasure at work, are predictors of stress and correlate with many negative health consequences, such as cardiovascular disease and high blood pressure (Elissis, 2016). Therefore, highlighting the importance of decreasing work-related negative affect and increasing work-related positive affect.

## *ii. Job Satisfaction*

A job is a group of tasks that a person completes for an organisation in exchange for some form of remuneration and the evaluation of the components that make up a job are added to determine overall job satisfaction. Thus, job satisfaction can briefly be defined as the extent to which one is content, satisfied, and self-motivated to perform one's job (Locke, 1969). When taking a new approach to research regarding happy workers, Page and Vella-Brodrick (2009) found that employee performance was predicted by job satisfaction. However, this outcome was moderated by employee well-being. Therefore, these results provide initial backing for the addition of job satisfaction as a component that influences employee well-being (Page & Vella-Brodrick, 2009).

As demonstrated, there is research to support the employee mental health model proposed by Page and Vella-Brodrick (2009), and the inclusion of Workplace Well-being (WWB), consisting of work-related affect and job satisfaction, in modelling the construct of employee well-being. Research has shown that using only general well-being measures to determine the well-being of employees at work may lead to inaccurate results, therefore work-related factors must be taken into consideration (Ilies et al., 2007).

Since establishing what components make up employee well-being, according to the employee mental health model (Page & Vella-Brodrick, 2009), as well as its importance, and organisational impact, this next section aims to outline ways to enhance it.

## **2.2 Enhancing Employee Well-being**

Employee well-being is a result of complex interactions of person-centred variables, and job characteristics that play out over a period of time. Consequently, there are several work-related factors that can impact employee well-being, such as the level of autonomy one has in their job,

the amount of recognition one receives, how they are measured and rewarded on their performance (Malinen et al., 2019), as well as leadership behaviours (Donaldson-Feilder et al., 2013) and workload (Mind, 2022). There are also numerous person-centred factors that can influence employee well-being, such as relationships at work and meaning at work (Mind, 2022). These factors can be addressed individually, or strategically by fostering an organisational culture that promotes mental health (Mind, 2022), or by implementing well-being initiatives (Malinen et al., 2019).

Mind (2022) released a report, suggesting numerous way to promote employee well-being, such as: actively demonstrating leadership's commitment to mental health, involving all employees in decision-making to help them understand how their role contributes to the organisation's mission, ensuring an open dialogue about mental health, promoting work-life balance, ensuring an optimal physical working environment, and encouraging one-to-one communication between employees and managers to promote positive working relationships (Mind, 2022). Organisations can also promote well-being by implementing employee assistance programmes (EAPs) and policies that support mental health and by providing training interventions that promote positive behaviours and stress management (Mind, 2022).

The current study chose to implement an online positive psychology intervention (OPPI), because research has shown that positive psychology interventions (PPIs) are quite successful in improving well-being (Pogrebtsova et al., 2017). Therefore, this section serves to outline the principles of positive psychology and explore PPIs aimed at enhancing employee well-being.

### ***2.2.1 Positive Psychology***

The domain of Positive Psychology has redefined mental health as a construct that goes beyond the absence of illness and expands the definition to encompass well-being and successful



adaption (Seligman & Csikszentmihalyi, 2000). Enhancing positive components of human behaviour, emotion, and cognition that have an impact on both an individual's and an organisation's well-being is crucial, according to positive psychology. (Gable & Haidt, 2005). The next section outlines the types of interventions that are underpinned by positive psychology theory, as well as the prevalence of technology and how to incorporate it in such interventions.

### **2.2.1.1 Positive psychological interventions (PPIs).**

Positive Psychology Interventions (PPIs) are designed to improve well-being by focusing on increasing positive emotions and finding the meaning in life, rather than focusing on decreasing the symptoms of poor well-being (White et al., 2019). Lyubomirsky and Layous (2013) stated that it is not enough to simply better one's circumstances to be happier and that willingly adopting positive methods on a cognitive and emotional level is the most effective way to boost happiness. These methods are referred to as Positive Psychology Interventions (PPIs; Dimitropoulou & Leontopoulou, 2017) because they work to promote positive feelings, actions, and attitudes.

By fostering abilities that allow people to produce happy emotions and control negative emotions, the majority of PPIs attempt to improve pleasant emotional experiences and reduce depressed symptoms. Examples of such interventions are the 'Three Good Things' (Seligman et al., 2005), the 'Counting Blessings' and the 'Loving-Kindness Meditation' (Dimitropoulou & Leontopoulou, 2017). The content of these interventions includes a series of activities that focus on strengths and positive constructs, such as hope, gratitude, optimism, and forgiveness (Dimitropoulou & Leontopoulou, 2017). The findings from two meta-analyses by Bolier and Abello (2014), as well as Sin and Lyubomirsky (2009) have shown that positive activities and interventions can effectively influence the enhancement of well-being.

Many researchers support the role that an individual's strengths have on their well-being. Research has shown that strength-based employee development can help employees regulate their behaviour and better meet their psychological needs (Ding & Yu, 2021). Once their psychological needs, such as autonomy, recognition, and personal development, are met they can function more effectively, which leads to the achievement of a higher sense of well-being (Page & Vella-Brodick, 2009; Malinen et al., 2019).

#### **2.2.1.2 Online Positive Psychology Interventions (OPPIs).**

PPIs are cost-effective and relatively easy to implement, particularly when implemented using technology, via online websites and mobile applications (Boiler et al., 2014). The cost benefits and easy access of such interventions have sparked an increase in implementation of online PPIs by organisations (Pogrebtsova et al., 2017). Organisations often implement these interventions due to the technological nature of the interventions, they are largely referred to as Online Positive Psychology Interventions (OPPI's). Research has shown that OPPIs and other online interventions that promote well-being are beneficial and have minor to moderate effects on well-being (Pogrebtsova et al., 2017; Yurayat & Seechaliao, 2021). Many OPPI's have also been tested on employees across several organisations and industries, therefore the results can be generalised to a larger population of employees (Meyers et al., 2013; Pogrebtsova et al., 2017).

A recent example of a short-term OPPI involved randomly assigning 90 caregivers to take part in a five to 10-minute positive reflection intervention that took place for 10 days (Clauss et al., 2016). The participants were instructed to choose a significant work-related event that occurred every day, to enter a state of deep breathing and mindfulness, and then to think about the good aspects of the experience. Every participant got an iPad with a daily reminder to practice the exercise during their break. The results demonstrated a reduction in emotional fatigue of

participants (Clauss et al., 2016). Similar effects have also been found with many other short-term online mindfulness training programmes involving employees. For instance, following a two-week online mindfulness training, workers in the education and healthcare sectors displayed considerably higher levels of emotional stability and job satisfaction (Hülshager et al., 2013).

Research shows that long-term OPPI's tend to show more significant results (Ivtzan et al., 2016). Emmons and McCullough (2003) conducted an experimental study of gratitude and subjective well-being in daily life, which was examined in two studies. Study 1 found that a two-week intervention that encourages the participants to "count your blessings" daily resulted in improvements in positive affect. Study 2, on the other hand, found that a similar ten-week intervention that was carried out on a weekly basis improved psychological well-being and decreased physical well-being complaints (Emmons & McCullough, 2003). Long-term OPPI's also involve training on a range of well-being topics via online lessons, videos, and guided exercises (Ivtzan et al., 2016). In a specific long-term intervention, employees were trained on several core positive psychology themes, one week at a time, over a period of eight weeks. The eight positive psychology themes included self-awareness, positive emotions, strengths, self-compassion, autonomy, positive relationships, meaning and savouring positive moments (Ivtzan et al., 2016). Employees were given a 10-minute introductory film on the positive psychology theme for the week, a daily 10-minute guided meditation, and a brief daily task like listing one's blessings. Indicators of participant well-being, including self-compassion, engagement, mindfulness, and positive relationships significantly increased, and sadness and stress decreased as a result of this long-term OPPI. (Ivtzan et al., 2016).

Overall, it can be demonstrated that the use of technology in conjunction with PPIs is a practical and evidence-based way to promote employee well-being (Clauss et al., 2016; Hülshager et al., 2013; Emmons & McCullough, 2003; Ivztan et al., 2016).

### **2.3 The Working for Wellness Programme**

For the purpose of this study, the researcher identified a long-term PPI, called the Working for Wellness Programme, designed by Page and Vella-Brodrick (2009). The PPI was designed based on Positive Psychology research with the aim to enhance employee well-being (Page & Vella-Brodrick, 2009). More specifically, the programme aims to nurture employee strengths and optimize employees' behavioural capacities and positive thoughts to enhance employee well-being (Page & Vella-Brodrick, 2012).

The programme is a six-week intervention where employees participate in weekly, one-hour well-being workshops, which involve reflection, activities, and discussions. In summary, the programme encourages employees to identify and apply their strengths in the workplace through various activities (Page & Vella-Brodrick, 2012). Next, an outline of each week's activities and the theoretical underpinning for those activities is discussed.

#### **2.3.1 Week 1: What is Workplace Well-being**

In the first session, the researcher introduces the contents of the OPPI. The construct of well-being is discussed, and participants rate their current state of well-being at work using a self-report measure. The researcher also covers the importance that intentional activities have on enhancing participants' happiness, which is backed by the *Sustainable Happiness Model (SHM)*. Lastly, as homework, participants are required to complete the positive psychology-oriented Values in Action (VIA) inventory of strengths for the next session.

### **2.3.1.1 The Sustainable Happiness Model (SHM).**

The SHM provides a theoretical framework for experimental intervention research on how to enhance and maintain happiness or otherwise known as SWB (Sheldon, & Lyubomirsky, 2019). This model proposes that the set point, life circumstances, and intentional acts are the three components that influence an individual's happiness. Sheldon and Lyubomirsky (2019) state that intentional activities, such as expressing gratitude and optimism, committing acts of kindness, and savouring positive life experiences, are the most promising way to enhance and sustain SWB.

### ***2.3.2 Week 2: Knowing and Using Strengths***

As mentioned before, a promising positive psychology method to enhance well-being is the facilitation and development of an individual's strengths (Ding & Yu, 2021). Research has shown that possessing certain strengths, such as gratitude, love, and hope, is positively correlated with well-being (Park et al., 2004). Therefore, in this session, participants explore their top character strengths derived from the VIA inventory of strengths and discuss how they currently apply these strengths at work.

Additionally, research by Wood et al. (2011) found that employing one's strengths can also boost well-being, and employees who do so are more likely to be content at work, which increases the amount of work-related affect (Page & Vella-Brodrick, 2012), and job satisfaction (Harter et al., 2002). Linley et al. (2010) stated that there are many ways in which individuals can use their strengths, such as job crafting, goal-striving, facilitating flow, as well as in their interpersonal relationships. Therefore, in this session job crafting is discussed as a strategy to apply their strengths at work.

### **2.3.3 Week 3: Goal Striving**

Research has shown that using strengths facilitates participants' progress towards goals (Ryan & Deci, 2000), as per *Self-Determination Theory (SDT)*, because strengths are intrinsically motivating because they show people' true selves (Linley et al., 2010). In this session, the researcher discusses the relationship between goal striving and well-being, and participants are asked to set strength-based goals and develop an action plan, based on *hope theory* (Snyder, 2002), to achieve those goals. These activities help individuals to achieve optimal functioning as a person, therefore developing their PWB (Page & Vella-Brodrick, 2012).

#### **2.3.3.1 Self-Determination Theory (SDT).**

SDT is a theoretical approach to human motivation (Ryan & Deci, 2000). This theoretical framework identifies three universal needs, namely, social relatedness (Baumeister & Leary, 1995; Reis, 1994), competence (Harter, 1978; White, 1963) and autonomy (deCharms, 1968; Deci, 1975). These needs have high influential power over human motivational behaviour and are essential for optimal psychological and social development, and for overall personal growth and well-being (Ryan & Deci, 2000). Therefore, this session aims to set goals that satisfy the three universal needs mentioned above, and that align with the individual's strengths to facilitate goal achievement (Page & Vella-Brodrick, 2012).

#### **2.3.3.2 Hope Theory.**

According to Snyder (2002), hope is a cognitive process that enables people to actively pursue their goals. As a cognitive process, hope is made up of pathways and agency thinking. Pathways thinking is an individual's ability to identify and create pathways to their goals, and agency thinking refers to an individual's perceived ability to successfully use the pathways created to achieve their goals (Snyder, 2002). Therefore, in this session participants create an action plan

to develop their thinking pathways, and agency thinking in order to achieve their goals (Page & Vella-Brodrick, 2012).

#### ***2.3.4 Week 4: Flow***

One's strengths can also be applied in the facilitation of flow. Flow is an intrinsically motivating state of mind that is experienced when one is fully engaged in a task (Bakker, 2005). Fritz and Avsec (2007), found that participating in tasks that are balanced in terms of one's abilities and task difficulty leads to flow, which then leads the individual to experience positive affect (PA) and satisfaction. Therefore, in this session, the researcher explains the importance of flow in relation to strengths, and how to encourage flow in and outside of work (Page & Vella-Brodrick, 2012).

#### ***2.3.5 Week 5: Relationships and Altruism***

Strengths can also be meaningfully applied and actualised in one's relationships in and outside of work. Fostering close relationships are beneficial to one's well-being (Stanton et al., 2019), specifically their PWB (La Guardia & Patrick, 2008). Therefore, in this session, the researcher discusses strength-based strategies that can be used to enhance relationships in and outside of work (Page & Vella-Brodrick, 2012).

#### ***2.3.6 Week 6: Consolidation of Learning***

In the last session, participants reflect on their experiences and create an action plan to continue progress after the OPPI (Page & Vella-Brodrick, 2012).

The overview of the Working for Wellness Programme and its theoretical underpinnings showed that the OPPI effectively addresses the components of employee well-being proposed in Page & Vella-Brodrick's (2009) mental health model. Additionally, Page and Vella-Brodrick (2012) evaluated the effectiveness of the PPI and found that it significantly increased employee well-being. Their results found a significant group-by-time interaction effect for PWB ( $A = .85$ ;  $F$

(3, 17),  $p = <.05$ ), and for SWB ( $A = .55$ ;  $F(3, 18)$ ,  $p = <.01$ ), and a significant main group effect for AWB ( $F(7, 96)$ ,  $p = .01$ ). Thus, forming a strong argument for the use of the Working for Wellness Programme in the current experimental study.

## **2.4 Implementing Gamification to Enhance Employee Well-being Interventions**

The development of technology has led to the evolution of a fast-paced, modern working world, where employees are facing new pressures, such as having to be constantly available online, and quickly adapting to technological changes as they arise (Barber & Santuzzi, 2015). These new pressures are coined as tele-pressures (Barber & Santuzzi, 2015). Although technology is the main contributor of employees' tele-pressures, researchers argue that technology can also be leveraged to reduce such pressures and enhance employee well-being (Pogrebtsova et al., 2017). This can be done by incorporating the latest technological strategies into existing PPIs.

One promising strategy is the implementation of gamification. Research states that gamification shows potential in enhancing the benefits of PPIs aimed at improving well-being (Johnson et al., 2016; Pogrebtsova et al., 2017). Gamification is a concept that is gaining popularity across academic disciplines, industries, and investors (Dorling & McCaffery, 2012). Its growing relevance is an outcome of the rapid developments in digital technology, new methods of tracking data and the fact that games are already heavily embedded in our human culture (Tolks et al., 2019). In this section, the construct of gamification and its theoretical underpinnings will be explored.

### **2.4.1 Gamification**

Gamification can be conceptualised as using game design elements in non-gaming situations to create gameful experiences (Deterding et al., 2011). Gamification is the process of



using game-like experiences' intrinsic incentive to achieve certain psychological and behavioural outcomes (Tolks, et al., 2019). When implemented correctly, gamification can result in many desired outcomes, such as engagement, motivation, loyalty, participation, efficiency, and behaviour changes (Meriono de Paz, 2013).

Gamification's affordances have also been proposed as a tool to enhance the benefits or outcomes of PPIs (Pogrebtsova et al., 2017). Gamification uses principles of psychology to understand human nature and how to influence psychological and behavioural outcomes (Deterding et al., 2011). Zichermann (2011) believes that gamified interventions should be made up of 75% psychology and 25% technology to achieve the best outcomes. Psychological elements from different psychological domains, such as social psychology, motivational psychology, and the psychology of learning, are used in gamified interventions to elicit feelings and engage users by satisfying their fundamental needs for achievement, recognition, and autonomy (Hommes, 2012). In this section, gamification will be explored in more detail using the afore-mentioned psychological theories and the gamification continuum (see Figure 2.3).

#### **2.4.1.1 Social Psychology.**

Principles of social psychology are used in gamification to influence behaviour. Research has shown that humans crave social interaction, and this can be used in gamified interventions to motivate users to engage in the intervention (McKenzie, 2011). Additionally, gamified applications make use of data to reach the desired outcome. Rajat Paharia (2012) states that users can be motivated to increase participation or improve performance when a gamified application provides visualisation and feedback on their performance in contrast with others. Furthermore, this is said to encourage healthy competition and improve productivity within organisations (Paharia, 2012).

### **2.4.1.2 Psychology of Learning.**

The psychology of learning outlines processes of effective learning methods and the anticipated outcomes of learning (Driscoll & Burner, 2005). For the purpose of this study Skinner's operant conditioning theory is discussed. The operant conditioning hypothesis centres on the notion that extrinsic motivators, such as external rewards and penalties, have an impact on learning and behavioural change (Merino de Paz, 2013). This theory has been implemented in gamified interventions, by rewarding points and external awards as a form of reinforcement (Deterding et al., 2011). Research suggests that this theory can be used to increase engagement and motivation, which is aligned with the primary aim of gamification (Merino de Paz, 2013). This theory suggests that researchers can disregard user's intrinsic needs and just distribute external rewards in order to engage and motivate users to perform a specific behaviour, but the next sections will show the importance of satisfying one's intrinsic needs too.

### **2.4.1.3 Motivational Psychology.**

Principles of motivational psychology are also used in gamification. Motivational psychology is said to hold the most influential power in gamification (Zichermann, 2011). Motivation can be defined as an internal need or desire that drives behaviour (Gears, 2012). Theories of intrinsic and extrinsic motivation are implemented in gamified interventions to create rewards that stimulate user behaviour (Deterding et al., 2011). Intrinsic motivation refers to pursuing activities that are rewarding by just performing the activity itself, while extrinsic motivation refers to pursuing an activity, because of the expectation of receiving external rewards (Zichermann, 2011). Both intrinsic and extrinsic motivators have multiple benefits in leveraging behaviour. However, research shows that participants' sense of intrinsic desire and satisfaction can diminish as a result of using

extrinsic rewards, such as monetary rewards as an incentive for tasks that are intrinsically motivating (Mitchell et al., 2020).

In contrast, motivation studies that used non-monetary incentives found that participant's intrinsic motivation and satisfaction increased, because the intervention was more aligned with the user's intrinsic motivations (Zichermann, 2011). Therefore, the most optimal motivational system must tap into participant's intrinsic motivations, while also providing extrinsic tangible and intangible rewards (Ryan & Deci, 2000). The next section will discuss relevant motivational theories to enhance the understanding of motivational affordances experienced through gamification.

#### *i. Self-determination Theory.*

Self-determination theory (SDT) was briefly discussed as part of the theoretical underpinning for Week 3's activities in the Working for Wellness Programme. As mentioned, SDT identifies three universal needs, namely, social relatedness (Baumeister & Leary, 1995; Reis, 1994), competence (Harter, 1978; White, 1963) and autonomy (deCharms, 1968; Deci, 1975). These needs have high influential power over behaviour and are essential for optimal psychological and social development, and for overall well-being (Ryan & Deci, 2000).

Social relatedness is the need for social interaction and relationships (Baumeister & Leary, 1995; Reis, 1994). In a game or game-like environment, this can be realized when users socialise with other users (Merino de Paz, 2013). Competence refers to the need to be able to perform certain tasks (Harter, 1978; White, 1963). In a game, a user can experience competence when they improve their skills and personally develop themselves (Merino de Paz, 2013). Lastly, autonomy refers to the need for independence (deCharms, 1968; Deci, 1975). In a game, this can be realised when a user can make their own decisions and choose their own path in the game (Merino de Paz, 2013).

McGonigal (2011) suggests that these three universal needs form the basis of intrinsic rewards and he identified four most effective intrinsic rewards related to work, namely, satisfying work, being successful, social connection and meaningful work. Satisfying work and the experience of being successful are related to realising the need for competence, while social connection is related to realising the need for social relatedness and meaningful work is also related to realising the need for relatedness (McGonigal, 2011).

Werbach and Hunter (2012) identified several motivational game elements, such as avatars, badges, leader boards, performance graphs, points, meaningful stories, and teams. Research has stated that the psychological effects of these game elements are linked to self-determination theory (Ryan & Deci, 2000; Shi & Cristea, 2016). It can be assumed that the psychological effects of gamification elements are linked to self-determination theory, because the expected results of gamification interventions rely on whether an individual has satisfied their need for autonomy, competence, and social relatedness (Tolks et al., 2019). This reiterates the idea that if an individual can gratify their need for autonomy, competence, relatedness, and meaning through gamified interventions, then it can be assumed that the individual will develop both psychologically and socially and improve their overall personal well-being (Ryan & Deci, 2000).

### *ii. Csikszentmihalyi's Flow Theory.*

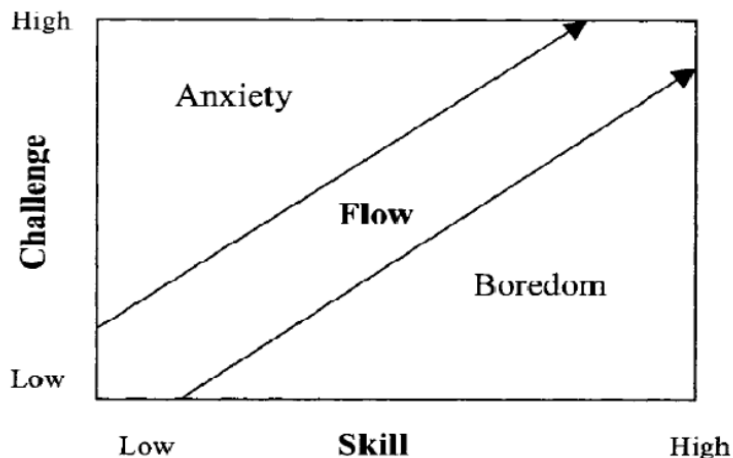
Csikszentmihalyi (1990) suggests that a flow of optimal intrinsic motivation must be reached for a task to be completely engaging. During a gamified intervention, a user's interest must be peaked, and the user must feel in control and not overwhelmed by the level of difficulty or complexity of the intervention (Xu, 2011). Flow within a gamified intervention creates a narrow focus, where the user feels fully motivated, competent, and rewarded. To achieve flow, there must be an optimal balance between complexity of the gamified intervention and capability of the user,

which can be depicted by the “flow channel” in Figure 2.2 (Xu, 2011; Brühlmann et al., 2013). The gamified intervention must not be too difficult causing anxiety, but it must also not be too easy that it causes boredom. The flow channel also relies on the availability of instant feedback and clearly defined goals (Csikszentmihalyi, 1990). Gamification allows interventions to be personalised to an individual’s motivational desires, which can personally stimulate flow (Brühlmann et al., 2013).

Using the afore-mentioned theories, it can be said that gamification can increase motivation and engagement, thus enhancing the effects of PPIs. This next section will explore the game design and the specific game mechanics that facilitate the motivational affordances of gamification.

**Figure 2.2**

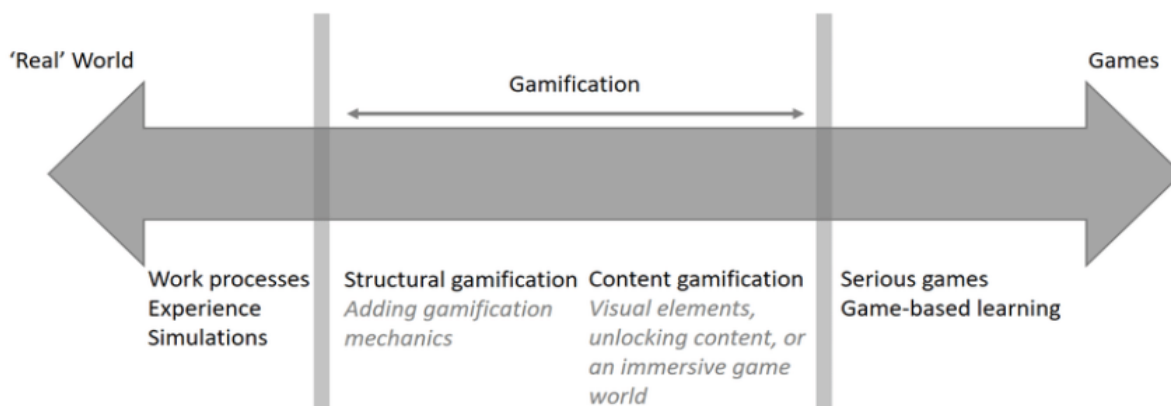
*Flow Theory Graph*



*Note.* A graph depicting the theory of flow. From “Literature Review on Web Application Gamification and Analytics,” by Y. Xu, 2011. CSDL Technical Report, Department of Information and Computer Sciences, University of Hawaii. (<http://csdl.ics.hawaii.edu/techreports/11-05/11-05.pdf>). Copyright by the University of Hawaii.

### ***2.4.2 Game Design***

Gamification uses elements and principles from game design. Game design refers to applying aesthetics and design principles to create games. Figure 2.3 depicts the gamification continuum, which explains the varying degrees of gamification in game design and the broad contexts in which it can be used (PentaQuest, n.d.). Gamification is frequently mistakenly referred to as serious games. Serious games refer to full-fledged games, whereas gamified experiences refer to the incorporation of game mechanics or elements. Serious games are used as a form of e-learning to train, develop skills or investigate (Muntean, 2011), and are used in different fields, such as health, education, business, politics, and engineering (Nistor & Iacob, 2018). Examples of serious games include airplane simulations to train pilots or medical game-based applications that allow medical students to learn critical skills, to name a few (Muntean, 2011). Both gamification and serious games are used for non-entertainment purposes, but serious games meet all the necessary conditions to be classified as a game, while gamified applications implement game mechanics appropriated from games (Deterding et al., 2011).

**Figure 2.3***The Gamification Continuum*

*Note.* The gamification continuum summarising the uses of gamification. From *Gamify Your Team* by PentaQuest, n.d. (<https://www.pentaquest.io/single-post/2017/05/23/The-gamification-continuum>).

Gamification can be implemented in two ways: structural and content gamification (Robin et al., 2018). Structural gamification refers to implementing game mechanics or elements, such as challenges, rewards, competitions, profiles, progress paths and feedback systems (Nahl & James, 2012). Content gamification refers to implementing visual elements, creating content, or creating an immersive world. Robson et al. (2015, p. 411) state that “mechanics are the decisions that designers, those who wish to gamify a non-game context, make to specify the goals, the rules, the setting, the context, the types of interactions, and the boundaries of the situation to be gamified.” A combination of game elements creates game dynamics, such as self-expression, relationships, personalisation, and progression, which are the desires and motivations that users form due to the motivational experience created by game elements (Bunchball, 2010). In this study structural gamification was implemented using specific game elements to gamify certain activities, creating a gamified OPPI.

To argue the potential of gamification in enhancing employee well-being, the next section will discuss the impact of gamification in the workplace and the relationship between gamification and employee health and well-being.

## **2.5 Gamification in the Workplace**

Gamification can be used in different fields, such as health, education, business, politics, and engineering (Nistor & Iacob, 2018). In organisations, it is suggested that organisational processes should be developed around an in-depth understanding of employees' motivations (Hennessy et al., 2012). An essential component in gamified processes is understanding users' desires and how to trigger their emotions (Merino de Paz, 2013), therefore, gamification can prove to be greatly beneficial to organisations in that sense.

Gamification is an innovative strategy used by businesses to encourage employees to learn new skills, boost productivity, or deepen their commitment to the company. A study by Eikelboom (2016) demonstrated that gamification can effectively increase motivation, adoption, and engagement in the workplace. Ultimately, gamification is seen as a low cost, non-monetary incentive strategy that organisations can use to deliver superior results in terms of quality and performance (Dorling & McCaffery, 2012).

There are multiple forms of gamification and game design elements applicable to workplaces. Gamification can be used in recruitment and selection purposes, public relations, training and development, up-skilling of the workforce, performance, and review processes, as well as personal development, thus creating gamified workplaces (Oprescu et al., 2014). Gamified workplaces do not refer to employees playing video games at work; rather, the environment is gamified. Organisations that use gamification to transform some of their work processes into



intrinsically motivating, game-like experiences for their employees by implementing a few game design tenets, like points and rewards, can be described as having gamified workplaces. This makes work experiences more interesting, enjoyable, and productive (Dorling & McCaffery, 2012).

When a job activity is repetitive and monotonous, there is a higher possibility of human error. However, by gamifying certain activities, it has been demonstrated that the task is more enjoyable and thus reduces the possibility of human error and raises the standard of work. (Merino de Paz, 2013). Organisations can also use gamification to boost innovative thinking by enabling workplace customization for enhanced individual control, therefore motivating employees to submit creative ideas (Merino de Paz, 2013). Additionally, gamification allows for efficient feedback of achievements and more observable indicators for employee progression, this leads to an improvement in employee morale and a better quality of work (Merino de Paz, 2013).

Research has also shown that gamification can enhance the well-being of employees (Kark, 2011; Johnson et al., 2016). The positive organisational impact of employee well-being has already been demonstrated above, therefore, this next section will describe the relationship between gamification and health and well-being to strengthen the argument of implementing gamification as a method to enhance employee well-being.

### ***2.5.1 The Relationship Between Gamification and Employee Health and Well-being***

The importance of employee well-being was discussed in Chapter 1, and Chapter 2 outlined different strategies to enhance employee well-being, with an emphasis on well-being interventions. Unfortunately, research has found high attrition rates in employee health and well-being interventions (Poole et al., 2001; Howarth et al., 2018), which can be strongly correlated to a lack of per-

sonal motivation to participate in health and wellbeing interventions and increased levels of boredom experienced during the interventions (Edwards, 2012). There are several factors that may contribute to the lack of motivation to participate in, and increased levels of boredom experienced during employee health and wellbeing interventions. Namely, lack of participation from leadership, privacy concerns, inconvenient or inaccessible interventions, as well as generic interventions (Aduro, 2021). IBM (2020) found that 54% of employees do not believe that their organisation supports their physical and mental health from an executive level, and this is often because of a lack of participation from leadership in health and wellbeing interventions offered at work. Research has also shown that employees are more likely to participate when they see the leadership participating (IBM, 2020). Secondly, employees' concerns about privacy may cause a decrease in participation because employees are often afraid to disclose personal information at work for fear of threatening their job security (Aduro, 2021). Thirdly, interventions that take up too much personal time after work and are not easily accessible online or in-person may also decrease an employees' motivation to participate in the intervention (Aduro, 2021). Lastly, generic interventions are the main contributor for employees experiencing boredom during health and wellbeing interventions, therefore it is important to ensure that all employees' needs are taken into consideration and a diverse intervention plan is developed (Aduro, 2021).

Edwards (2012) advised organisations to be more innovative and implement strategies, such as rewards, incentives and feedback systems. These strategies can help to increase motivation to participate and reduce boredom during health and well-being interventions (Edwards, 2012), thus potentially increasing the outcomes of employee well-being interventions. Research showed

that gamification was an innovative mechanism that aided in delivering such strategies successfully (Johnson et al., 2016). This next section will discuss the influence of gamification on employee health and well-being.

During the past ten years, there has been a sharp surge in technology advancements used to monitor and improve an individual's health and well-being (Calvo & Peters, 2014). One prominent innovation is the development of serious games for health improvement (Wattanasoontorn et al., 2013). The expansion of serious games and the incorporation of game elements into health and well-being improvement interventions is used because of its ability to motivate individuals to positively change their health behaviours (Deterding, 2015). Research has shown that serious games, if designed well, can increase motivation and engagement of the user, because playing them satisfies a fundamental human need (Johnson et al., 2016).

A review of literature by Johnson et al. (2016) found that most of the research on gamification in the domain of health and well-being study the impact of gamification on physical health, with few studies evaluating the impact of gamification on mental health and well-being. This section will evaluate a few gamified interventions aimed at improving the mental health and well-being of working individuals.

Ahtinen et al. (2013) designed a mobile app, called "Ovia". The app was designed to enhance the mental health of working adults by enhancing wellness skills through daily activities based on the principles of acceptance commitment therapy (ACT). Gamification elements were implemented in the form of rewards and progress paths. Participants received "virtual roses" as a reward for completed tasks and graphical progress paths were available to provide immediate feedback (Ahtinen et al., 2013). A field experiment, testing the usefulness of the app, revealed that participants' mental health did increase, but there was no comparison study of a gamified versus

non-gamified version (Ahtinen et al., 2013). Therefore, it is difficult to evaluate the efficacy of the game elements on improving the mental health of working adults.

Facebook designed an app aimed at enhancing the mental health and well-being of its users. The app implemented gamification in the form of rewards and paths. Users could receive points and badges for completing tasks and for interacting with other users (Hall et al., 2013). Hall et al. (2013) conducted a study to evaluate this gamified tool. User rates and self-report surveys were used, which indicated that the gamified tool led to a positive user experience, and an increase in mental health. The study also found a higher correlation between mental health and points and progress paths than with badges (Hall et al., 2013). Unfortunately, there was no comparison study of a gamified versus non-gamified version (Hall et al., 2013), therefore it is difficult to assess the efficacy of gamification on improving the mental health and well-being of the users.

Ludden et al. (2014), evaluated an online gamified training intervention, called “This is Your Life”, that is aimed at improving the mental health and well-being of primary school teachers. The training intervention incorporated game elements, such as challenges, levels, and a progress map of their “journey” (Ludden et al., 2014). The study conducted a pre- and post-intervention evaluation using self-report surveys. The results showed an increase in the participant’s mental health and well-being, and the participants stated that the game elements motivated them to do the training by making the intervention “challenging and playful” (Ludden et al., 2014). Unfortunately, there was no comparison study of a gamified versus non-gamified version of the intervention, therefore, it is difficult to assess the efficacy of gamification on improving the mental health and well-being of primary school teachers.

There is a common thread identified, in that most research conducted on the effect of gamification on mental health and well-being does not test the efficacy of gamification by making use

of comparison studies. There is a large amount of evidence showing that gamified well-being interventions lead to an increase in mental health and well-being, but it is questionable to what extent the increase can be attributed to gamification, if at all. Therefore, there is a necessity for studies to evaluate the efficacy of gamification in improving employee well-being.

Consequently, the following research hypotheses were formulated for this study:

*Hypothesis 1:*

The gamified intervention is more effective than the non-gamified intervention in increasing employee wellbeing.

*Hypothesis 2:*

The gamified intervention is more effective than the non-gamified intervention in increasing subjective well-being (SWB).

*Hypothesis 3:*

The gamified intervention is more effective than the non-gamified intervention in increasing psychological well-being (PWB).

*Hypothesis 4:*

The gamified intervention is more effective than the non-gamified intervention in increasing workplace well-being (WWB).

This study aimed to test these hypotheses using an experimental design, thus contributing to the domain of health and well-being, by providing evidence on the efficacy of gamification in an OPPI aimed at increasing employee well-being.

## 2.6 Summary

This chapter successfully established an understanding of existing research on gamification and its impact on employee well-being interventions. This was done by firstly demonstrating the importance of employee well-being for organisational success. However, research shows that there is a lack of participation and engagement in organisational interventions aimed at increasing employee well-being. Gamification offers an innovative solution to this problem, by implementing game design elements to increase motivation and engagement in such interventions. By increasing motivation and engagement in the intervention, it is hypothesized that expected outcomes of the intervention will increase, but there is no evidence to support that this increase is due to the implementation of gamification due to a lack of comparison studies. Therefore, this research study aimed to evaluate the efficacy of gamification in an OPPI aimed at increasing employee well-being by conducting an experimental study, where the researcher incorporated game design elements into the Working for Wellness Programme.

## Chapter 3

### Research Methodology

The purpose of this research study was to test the efficacy of gamification in an OPPI aimed at increasing employee well-being, specifically within a South African organisation. The researcher set out to use the OPPI, the Working for Wellness Programme. Previous research evaluated the intervention and concluded that it successfully increased employee well-being (Page & Vella-Brodrick, 2012). Therefore, this study implemented this intervention and gamified it to empirically evaluate the efficacy of gamification in an OPPI aimed at increasing employee well-being.

After a thorough review of existing literature, it was argued that such interventions were needed in organisations. However, it is vital to empirically evaluate the effectiveness of the specific gamified intervention used in this study, thus, this chapter outlined the rationale of this research study, the research design, hypotheses, and sampling procedures used in this study.

#### 3.1 Research Aim, Question, Objectives and Hypotheses

The research question and corresponding objectives stemmed from a review of literature that found strong evidence of the positive impact that gamification has in the health and well-being domain (Johnson et al., 2016). However, there is a lack of comparison studies to demonstrate the effectiveness of gamification in employee well-being interventions (Johnson et al., 2016). This gap underpins the aim of the study, which was to evaluate the efficacy of a gamified versus non-gamified OPPI, the Working for Wellness Programme, aimed at increasing employee well-being.

This study is distinctive because, to the researcher's knowledge, it is the first significant study in South Africa to propose to explore the effectiveness of gamification in an OPPI intended to increase employee well-being.

Ultimately, the study was directed at answering the primary research question; “*To what extent is a gamified OPPI more effective in increasing employee well-being than a non-gamified OPPI?*” This question was addressed through the following research objectives:

- To clarify the role of gamification in employee well-being interventions,
- To gamify an OPPI, the Working for Wellness Programme,
- To evaluate the efficacy of a gamified OPPI in comparison to a non-gamified OPPI in increasing employee well-being using a controlled field experiment.

The researcher chose to gamify the Working for Wellness Programme (herein referred to as the OPPI) by Page and Vella-Brodrick (2009), which was developed based on their mental health model as discussed in Chapter 2. This programme has proven to be an effective intervention in increasing employee well-being in an Australian context. However, it is necessary to also examine its effectiveness in the South African context. Moreover, the investigation of gamified OPPIs is sparse. The objective of gamifying the OPPI is to examine whether the addition of game design elements leads to increased levels of employee well-being.

Consequently, the following research hypotheses were formulated:

*Hypothesis 1:*

The gamified intervention is more effective than the non-gamified intervention in increasing employee wellbeing.



*Hypothesis 2:*

The gamified intervention is more effective than the non-gamified intervention in increasing subjective well-being (SWB).

*Hypothesis 3:*

The gamified intervention is more effective than the non-gamified intervention in increasing psychological well-being (PWB).

*Hypothesis 4:*

The gamified intervention is more effective than the non-gamified intervention in increasing workplace well-being (WWB).

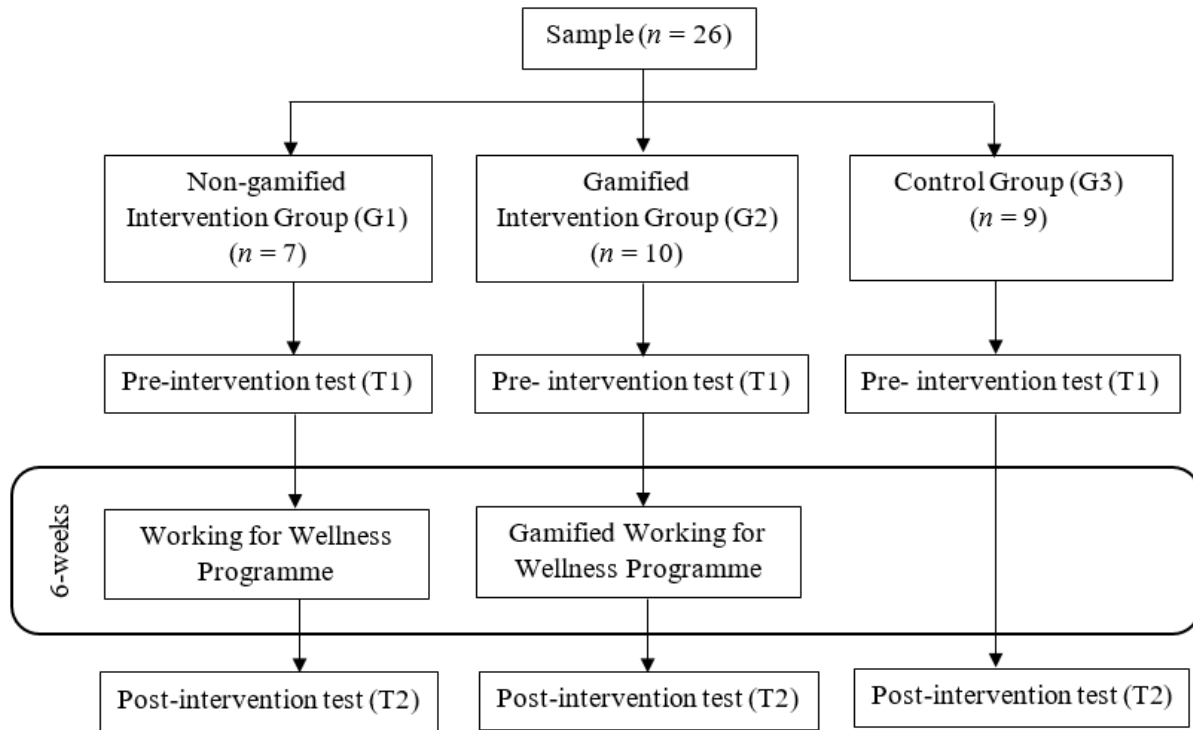
**3.2 Research Design**

For the purpose of this research a quantitative research design will be followed. Quantitative research can be defined as the systematic investigation of phenomena, using statistical techniques to gather numerical data (McBeath, 2020). Quantitative research is ideal for this study because, it enables the researcher to quantify qualitative information obtained from the online surveys to better comprehend certain aspects of the world. The quantitative research design was carried out using self-administered questionnaires that were distributed via Stellenbosch University's online survey system, Checkbox.

To address the research question, this study followed a true experimental research design to investigate the efficacy of a gamified OPPI on employee well-being. The control group is not exposed to a stimulus in an experimental design, whereas the experimental group is, and thereafter the effect of the stimulus is compared between groups (Babbie & Mouton, 2011). A true

experimental research design is successful when the change in the dependent variable is due to a change in the independent variable. In this study the dependent variable is the level of employee well-being, and the independent variable is gamification. If all groups display a change in the dependent variable, then the change is likely due to external factors (Babbie & Mouton, 2011).

In the present study there were three conditions; Condition A was the non-gamified intervention, Condition B was the gamified intervention and Condition C was the neutral condition, which ensured that one group was not exposed to any stimulus. Following the experimental design, all participants in each condition had to complete pre- and post-intervention assessments of their employee well-being. Pre-intervention assessments were conducted one week before the non-gamified and gamified positive strengths-based interventions took place (T1), and then post-intervention assessments were conducted immediately after the 6-week interventions were completed (T2). This study differed from Page and Vella-Brodrick's (2012) in that it was not conducted as a longitudinal study, and the results were only measured over two time periods.

**Figure 3. 1***Illustration of the Research Design*

### 3.2.1 Sampling

According to Babbie and Mouton (2011), sampling is referred to as a method of selecting observations. When conducting any research, researchers must select a representative sample of the population to be able to generalise the study's results (Marshall, 1996). Babbie and Mouton (2011) emphasise the comparability of the experimental and control groups. The experimental and control groups should ideally be as close as possible, with one exception: the experimental groups are exposed to a condition that the control group is not. Frequently, the sample strategy is selected based on the study's objectives, which is to determine the efficacy of a gamified OPPI aimed at increasing employee well-being.

In the present study, the researcher identified the target population as current employees working in a South African organisation. This study made use of an existing OPPI and distributed internet-based electronic self-report measures to collect primary data. For these reasons, only employees who had access to a computer and the internet took part in the study.

Once the organisation was recruited and written permission to conduct this study at the organisation was acquired, the researcher made use of an organisational representative to help with the recruitment of participants and for any assistance needed during the course of the intervention. The organisational representative emailed the participant recruitment letter to prospective participants (employees), that was requesting participation in the study and permission to distribute their contact details, specifically email addresses, to the researcher. Once employees agreed to participate and permission was granted to distribute their email addresses, the researcher sent the employees an email to introduce themselves and their study. The researcher also sent each participant a consent form (See Appendix B) via email, which was required in order to provide informed consent to take part in the study. Each participant was then sent a copy of their signed consent form and randomly assigned to an experimental group.

In this study, there were three groups, specifically:

- i. Control group (G3),
- ii. Experimental variant 1 (non-gamified intervention; G1), and
- iii. Experimental variant 2 (gamified intervention; G2)

Therefore, the researcher ideally required three same-sized representative samples.

To estimate the required sample size an *a priori* power calculation was conducted using Cohen's (1992) *d* table. Practically, the researcher estimated a large effect size of  $f = .35$  for the

primary research aim, at an achieved power of .80 (Cohen, 1992). The calculation indicated that a total of 42 participants were needed for the study. Consequently, approximately 14 participants per group were ideally needed to detect a significant difference between the experimental groups and control group with 80% probability that an acceptable difference existed.

### ***3.2.2 The Working for Wellness Programme***

For this study, the researcher decided to use an OPPI designed by Page and Vella-Brodrick (2009) called the Working for Wellness Programme. The Working for Wellness Programme is a six-week OPPI that was designed to improve employee well-being (Page & Vella-Brodrick, 2009).

Page and Vella-Brodrick's (2012) conducted an exploratory study, that followed an experimental and qualitative research design to evaluate the effectiveness of the intervention. The study was conducted in a governmental organisation in Australia (Page & Vella-Brodrick, 2012). 60 employees consented to participate in the study, however only 23 completed all the surveys ( $N = 23$ ). The sample consisted of 80% female and 20% male and was made up of ages ranging between 21 and 57 years old, with a blend of employees from different branches and the company's head office (Page & Vella-Brodrick, 2012).

The programme consisted of six, weekly one-hour sessions for each participant. These sessions took place during normal working hours and were conducted online using Microsoft Teams. Each experimental group was divided into smaller groups (4-6 participants per group) to hold more manageable group sessions. All sessions were facilitated by the researcher, who followed a pre-determined training manual that ensured consistency across groups. Each weekly session had a specified topic, which participants were encouraged to engage with, and then complete simple homework tasks for the next session. The weekly session overview for the six-week programme is as follows:

### **3.2.2.1 Week 1: What is Workplace Well-being.**

In the first session, the researcher introduced the contents of the OPPI. The construct of well-being was discussed, and participants rated their present state of employee well-being. The researcher covered the importance that intentional activities have on enhancing participants' happiness. Lastly, participants were required to complete the values in action (VIA) signature strengths test for the next session.

### **3.2.2.2 Week 2: Knowing and Using Strengths.**

In this session, participants explored their top strengths and discussed how they apply these strengths at work. Job crafting was discussed as a strategy to apply their strengths at work.

### **3.2.2.3 Week 3: Goal Striving.**

In this session, the researcher discussed the connection between pursuing goals and happiness, and then participants were asked to set strength-based goals and developed an action plan to achieve those goals.

### **3.2.2.4 Week 4: Flow.**

In this session, the researcher discussed the importance of flow in relation to strengths, and how to encourage flow in and outside of work.

### **3.2.2.5 Week 5: Relationships and Altruism.**

In this session, the researcher discussed the importance of interpersonal relationships on well-being, as well as strength-based strategies that could be used to enhance relationships at and outside of work.

### **3.2.2.6 Week 6: Consolidation of Learning.**

In the last session, participants reflected on their experiences and created an action plan to continue progress after the OPPI.

Each participant received the training materials, including a resource pack and activity book, in the first session. The control group did not engage in any training, but they were offered the opportunity to receive the training and the materials at the end of the study.

Page and Vella-Brodrick's (2012) study used a mixed method ANOVA to test the outcomes of the intervention and conducted focus groups and debrief sessions to collect qualitative feedback data regarding the process and effectiveness of the intervention (Page & Vella-Brodrick, 2012). The results showed alignment with their predictions. Participants who took part in the Working for Wellness Programme showed significant increases in general and work-related well-being, while participants in the comparison group did not exhibit these increases. In terms of general well-being, there was a significant group-by-time interaction effect for PWB ( $\lambda = .85$ ;  $F(3, 17)$ ,  $p < .05$ ), and for SWB ( $\lambda = .55$ ;  $F(3, 18)$ ,  $p < .01$ ). From time-one (T1;  $M = 66.10$ ) to time-two (T2;  $M = 72.60$ ) there was a positive difference in estimated marginal means for PWB in the intervention group (Page & Vella-Brodrick, 2012). Similarly, the intervention group experienced an increase in SWB from T1 ( $M = 32.19$ ) to T2 ( $M = 51.68$ ). In terms of work-related well-being, WWB and AWB showed no significant group-by-time interaction effect. However, the results showed that there was a significant main group effect for AWB ( $F(7, 96)$ ,  $p = .01$ ), where the estimated marginal means increased from T1 ( $M = 66.38$ ) to T2 ( $M = 74.09$ ) for the intervention group and decreased for the control group from T1 ( $M = 66.51$ ) to T2 ( $M = 56.59$ ) (Page & Vella-Brodrick, 2012). Therefore, participants in the intervention group gradually experienced more positive work-related affective well-being than those in the comparison group, over time (Page &

Vella-Brodrick, 2012). Ultimately, the intervention was effective in increasing employee well-being.

### ***3.2.3 Implementing Structural Gamification***

For the purpose of this study, shallow structural gamification was used by implementing specific game design elements to gamify the OPPI. The game design elements used included: badges, and individual and group progress paths, such as an individual employee well-being meter (Appendix D) and weekly progress report (Appendix E), as well as a group progress map (Appendix F) depicting the journey towards the end goal, employee well-being. Only participants assigned to the gamified intervention group were exposed to these game elements.

#### **3.2.3.1 Implementing Progress Paths.**

By completing the weekly individual activities and participating in the group sessions, participants positively contributed towards their employee well-being, which was depicted on their individual employee well-being meter and individual progress reports (See Appendix E). Participants' employee well-being meters and progress reports were updated after each weekly session and emailed separately to each participant to ensure confidentiality. These individual progress paths allowed participants to visualise their individual progress towards employee well-being and intrinsically motivated them to engage in the weekly activities to achieve a more favourable progress report than the previous week.

Additionally, after each weekly session, each group received a collective feedback report via email. This report contained a group progress map (See Appendix F) demonstrating what the group had learnt thus far and next stage of the OPPI. This allowed the participants to visualize their progress as a group and encouraged social connectedness (McGonigal, 2011).



### **3.2.3.2 Implementing Badges.**

During each session, different topics were discussed, and activities were reflected upon. These sessions required engagement and social interaction, therefore several different virtual badges (See Appendix G) were awarded to specific participants who engaged with the topics, completed the activities and, or interacted with other participants. These badges were also awarded in the weekly group feedback report, which allowed participants to fulfil their need for social recognition (McGonigal, 2011), and it also encouraged the other participants to engage more in the sessions, because they also wanted to fulfil this need.

### **3.2.4 Data Collection**

Data collection encompasses observing, collecting, and organising information about the respondent's behaviour, attitudes, and other characteristics (Kotler et al., 2016). In the present study, the recruited organisation was approached to conduct the intervention and obtain data from several employees in the sales and marketing departments. An organisational representative provided a list of 58 employees who agreed to voluntarily participate in the researcher's study. The researcher then contacted the employees via email to obtain informed consent and obtained informed consent from 48 employees. The 10 employees who did not give their informed consent either did not respond to the email or decided to not participate in the study due to personal reasons. The researcher then randomly assigned the participants into one of three groups: the control group, the non-gamified intervention group, or the gamified intervention group. Upon completion of the intervention, the non-gamified group had 7 participants ( $n=7$ ), the gamified group had 10 participants ( $n=10$ ) and the control group had 9 participants ( $n=9$ ). Therefore, from the 48 participants, there was a 54% response rate at time-two (T2) due to attrition and candidates not completing the survey on time or correctly.

The data collection was conducted using a survey software called CheckBox to collect the responses of the self-assessment measures used to measure employee well-being, and the survey link was distributed to participants via email. This approach was chosen for various reasons. Firstly, the OPPI was conducted via online correspondence, using Microsoft Teams, therefore it was beneficial to remain with one mode of distribution, being electronic and internet based. Next, it ensured faster distribution, faster turnaround time, lower processing and distribution costs and more geographical flexibility (Kotler et al., 2016).

There were several self-assessment measures that were used to measure the employee well-being of the participants and obtain data for this study (See Appendix C). The data was obtained at two time-points, namely:

- i. Time one (T1): employee mental wellbeing before the intervention commenced, and
- ii. Time two (T2): employee mental wellbeing immediately after the completion of the 6-week intervention.

### ***3.2.5 Measurement Instruments***

For this study, several indicators of employee well-being were used, specifically: life satisfaction, positive and negative affect, workplace well-being, work-specific affect, and psychological well-being. To accurately measure employee well-being and answer the research question, each predictor had to be measured using reliable and valid measures.

A more thorough assessment of the validity and reliability of the selected metrics is provided in the following section.

### **3.2.5.1 The Satisfaction with Life Scale (SWLS).**

Life satisfaction was assessed using the Satisfaction with Life Scale (SWLS; Diener et al., 1985). The SWLS is a measurement of life satisfaction (LS), also known as cognitive subjective well-being (SWB) (Diener et al., 1985). The measure has satisfactory levels of discriminant validity and internal reliability (Diener et al., 1985), and is strongly correlated with other measures of SWB (Pavot & Diener, 1993). The SWLS is a five-item, 7-point Likert response style scale (Diener et al., 1985). An example item is, “In most ways my life is close to my ideal”, where participants have to respond on a Likert scale, ranging from “Strongly Agree” to “Strongly Disagree”.

### **3.2.5.2 The Positive and Negative Affect Schedule (PANAS).**

The Positive and Negative Affect Schedule (PANAS; Watson et al., 1988) was used to measure positive and negative affect. The PANAS is a 10-item scale measuring the affective component of SWB (Watson et al., 1988). Participants were instructed to rate each item on a five-point Likert-type scale to measure trait-affect. The scale ranged from 1 = very slightly or not at all to 5 = extremely, according to how they feel generally (Watson et al., 1988). An example item measuring positive affect is, “Indicate to what extent you feel enthusiastic at the present moment or within the past week”, and an example item measuring negative affect is, “Indicate to what extent you feel distressed at this present moment or within the past week”.

The positive affect (PA) scale had excellent internal consistency, with a Cronbach's alpha ( $\alpha$ ) range of .86 to .90, while the negative affect (NA) scale had good internal consistency, with a Cronbach's alpha ( $\alpha$ ) range of .84 to .87, according to Watson et al. (1988). The SWLS, PA, and NA scales have been utilised as an aggregate measure of Diener's (1984) SWB before creating a composite SWB measure. Page and Vella-Brodrick (2012) found that this approach was valid in measuring SWB, with all three variables loaded on a single factor. Additionally, they found that

the single-loaded factor accounted for 57.5% and 65% of the variance over the two time points in their research experiment, respectively (Page & Vella-Brodrick, 2012).

### **3.2.5.3 The Workplace Well-being Index (WWBI).**

Workplace well-being of participants was measured using the Workplace Well-being Index (WWBI; Page, 2005). Both Page (2005) and Grant et al. (2009) have reported high levels of internal consistency ( $\alpha = .90$ ). Responses are recorded on an 11-point Likert-type scale ranging from “1 = Completely dissatisfied” to “11 = Completely satisfied”. An example of an item is, “How satisfied are you in your job?”. Items are averaged to create a total WWBI score (Page, 2005). Page and Vella-Brodrick (2009) found an average internal consistency for WWBI was  $\alpha = .94$  over time.

### **3.2.5.4 The Affective Well-Being (AWB) Scale.**

Work-related affect was measured by a 30-item Affective Well-being Scale (AWBS; Daniels, 2000). The item responses are recorded on a 6-point Likert-type scale, ranging from “1 = not at all” to “6 = very much”. The AWB scale represents the five axes on the “Circumplex model”: anxiety-comfort (e.g., “anxious”, “relaxed”), depression-pleasure (e.g., “miserable”, “happy”), bored-enthusiastic (e.g., “sluggish”, “motivated”), tiredness-vigour (e.g., “fatigued”, “alert”), and angry-placid (e.g., “annoyed”, “at ease”). Daniels' (2000) confirmatory factor analysis (CFA) revealed that the five-factor solution was a reliable indicator of affect at work. The subscales' internal reliability scores ranged from .79 to .88, hence it can be claimed that the average AWB score has a respectable level of reliability. In the study by Page and Vella-Brodrick (2012), they found an average internal consistency of  $\alpha = .94$  for AWB across time.

### **3.2.5.5 Scale of Psychological Well-Being (SPWB).**

The 42-item Scale of Psychological Well-Being (SPWB) was used to measure psychological well-being (PWB; Ryff, 1989). The construct of PWB has six dimensions, specifically: self-acceptance, personal growth, environmental mastery, autonomy, purpose in life, and positive relations with others. The SPWB measures these six dimensions by recording the degrees of agreement on a seven-point Likert scale from 1 = “strongly disagree” to 7 = “strongly agree”. Springer et al. (2006) suggested that a combined PWB score, consisting of the six dimensions loaded onto a single factor, be utilized to obtain a more reliable indication of PWB. This combined score, made up the composite SPWB, which proved to show more internal consistency than the individual subscales ( $\alpha = .90$ ) over time (Page & Vella-Brodrick, 2009).

### **3.2.6 Data Analysis**

Once the data was collected, hypotheses were tested using mixed model repeated measure ANOVAs, involving group (control, non-gamified intervention, gamified intervention) by time (pre- and post-intervention) interactions, as well as post-hoc tests.

### **3.3 Internal and External Threats to Validity**

Internal validity is the level of assurance that the experiment's findings are caused by the independent variable, in this case, the gamified intervention, and not due to extraneous factors. External validity refers to the generalisability of the study's results (Slack & Draugalis, 2001). There are several threats to the validity of this study, specifically: history, maturation, testing, instrumentation, regression, selection, and mortality. This section will explain these threats and how the researcher attempted to mitigate them to ensure the integrity of the research design.

### **3.3.1 History**

History refers to the events that take place between the pre- and post-intervention assessments (Cook & Campbell, 1979). Variables such as, time of day, time of the week or time of the year, as well as different experimenters can influence the results of the study (Cook & Campbell, 1979). Therefore, in an attempt to combat history bias, the gamified intervention and non-gamified intervention groups participated in the weekly, one-hour sessions during the same six-week time period, and all the sessions were conducted by the same experimenter.

For both the gamified intervention and non-gamified intervention groups' sessions to run simultaneously each week, there would have needed to be a second experimenter, who would have been randomly assigned to each group per week to ensure that participants had balanced exposure to both experimenters. This would have been the ideal research setting, but for practical reasons this study made use of only one experimenter.

### **3.3.2 Maturation**

Maturation refers to the changes that occur within participants as a result of time passed (Cook & Campbell, 1979). Maturation bias was controlled, to an extent, by conducting the Working for Wellness Programme for the gamified and non-gamified intervention groups over the same six-week period. In the event that any major changes occurred in a participant, the researcher planned to interview the participant to determine if any major life events occurred during the time of the intervention, therefore the researcher could offer insight into the reasons for any major changes during the interpretation of the data.

### ***3.3.3 Response Shift Bias***

Response shift bias is a source of contamination in self-report measures that causes inaccurate pre-intervention assessment results (Cook & Campbell, 1979). Response bias can be controlled by using retrospective pre- and post-intervention assessments, which involves collecting pre- and post-intervention assessment results at the same time. This allows participants to accurately assess their state of well-being before and after the intervention.

For the purpose of this study, the research design followed a true experimental pre- and post-intervention test and, therefore, response shift bias must be taken into consideration.

### ***3.3.4 Instrumentation***

Instrumentation refers to changes in instruments, observers and scorers that could influence the results (Cook & Campbell, 1979). To eliminate instrumentation bias, this study used the same measures pre- and post- intervention and used one experimenter to conduct the interventions across all three groups.

### ***3.3.5 Regression***

Regression refers to the regression of scores to the mean and is caused by selecting participants with extreme scores (Cook & Campbell, 1979). Regression was controlled by determining the differences in means of each group pre- and post-intervention.

### ***3.3.6 Selection***

Selection bias occurs when comparison groups are chosen for the parallel groups, therefore not allowing for generalisability of the study's results (Cook & Campbell, 1979). To eliminate selection bias in this study, participants from differing departments and seniority levels in the organisation were randomly assigned to a group using an online random selection generator. By using random assignment, the study's results are more generalisable to all employees.

### **3.3.7 Mortality**

Mortality refers to the loss of participants over the course of the intervention, which can impact the results of the study (Cook & Campbell, 1979). Mortality bias was initially controlled by inviting more than the estimated number of participants for the sample. The researcher emailed 58 employees to participate in the study and obtained informed consent from 48 employees. During the experiment one participant dropped out due to resigning from the organisation. Additionally, several participants' information could not be used due to the participant's inputting the incorrect identifier (i.e., personal cell phone number) when completing the pre- and post-test, therefore the study consisted of a sample of 26 participants.

### **3.4 Ethical Considerations**

The purpose of reflecting on potential ethical risks associated with this study was to protect the dignity, rights, safety, and well-being of the research participants that were involved in this study (Standard Operating Procedure, 2012). This study had a behavioural component to it, therefore it required active or passive participation of people, which could have led to the compromise of participant's dignity, rights, safety, and well-being. This study had a purpose that was argued in Chapter 1. Therefore, the critical question was whether the compromise of the participants was balanced with the benefits of the research findings on society (Standard Operating Procedure, 2012).

Every research participant had the right to voluntarily decide whether he/she wished to accept the invitation to participate in the research. To make an informed decision on whether he/she wished to participate in the research, the participant was first informed of the purpose and objectives of the research; who the researcher was; what their affiliation was; what participation



in the research involved; what their rights as participants were and how the research results would be used and distributed (Standard Operating Procedure, 2012). Once the potential participants were properly informed about the study and an informed decision was made, the researcher obtained signed consent forms from each participant via email. This aimed to decrease response bias for the researcher and addressed the concerns of sensitive information being freely available within the organisation.

Participants were able to withdraw at any time without consequences of any kind. Upon withdrawal from the study, the researcher requested permission to conduct a follow-up interview to understand the reasons for withdrawing, which was helpful during the interpretation of the data.

The researcher requested that the participants used a unique identifier (i.e., personal cell-phone number) during the data collection process to be able to link participants' responses over time (i.e., T1 and T2), and to ensure that participants' identity was protected. The participants used their personal cell-phone number as their 'Name' when they answered the pre- and post-intervention tests (i.e., at T1 and T2). The participant's personal cell-phone numbers were removed and replaced with an unidentifiable code once the data was exported into excel (i.e., at the back-end of the data collection process) and before the data was statistically analysed and interpreted. This allowed the researchers to link each participant to their responses over time-one (T1), and time-two (T2).

The study involved the assessment of critical latent variables, where the possibility of extremely low or high scores could have indicated a serious threat to the well-being of a research participant. In this case, Annexure 12 of the Ethical Rules of Conduct for Practitioners Registered under the Health Professions Act (Act no. 56 of 1974) (Republic of South Africa, 2006, p.41)

requires psychological researchers to disclose confidential information under the following circumstances:

A psychologist may disclose confidential information –

- (a) only with the permission of the client concerned;
- (b) when permitted by law to do so for a legitimate purpose, such as providing a client with the professional services required;
- (c) to appropriate professionals and then for strictly professional purposes only;
- (d) to protect a client or other persons from harm; or
- (e) to obtain payment for a psychological service, in which instance disclosure is limited to the minimum necessary to achieve that purpose.

Additionally, participation in the online survey could have elicited negative emotions in participants. If participants were feeling emotionally distressed and required counselling, they were offered various organisational and external resources (See Appendix B).

The recruited organisation was given enough information about the research to enable them to select how they wanted the research pertaining to their employees to be handled, which was another factor that was taken into account. Therefore, informed institutional permission was required and obtained. The researcher also debriefed the organisation after the data was collected.

The Research Ethics Committee of Human Research (Humanities) of Stellenbosch University approved the ethical clearance of this research study.

### **3.5 Summary**

In this chapter a thorough explanation of the research aim, question, objectives, research design and procedures, as well as the measurement instruments utilised in this research investigation was made available. All the measurement instruments selected have proven to be reliable and valid, and the research methodology that was employed to answer the research question was supported by research. Additionally, this study took account of the necessary ethical considerations, and approval was issued by the Research Ethics Committee (REC) for Social, Behavioural and Education Research (SBER) at Stellenbosch University (See Appendix A).

## Chapter 4

### Research Results

The aim of this research study was to conduct a controlled field experiment to investigate the efficacy of a gamified OPPI (G2) aimed at increasing employee well-being in comparison to a non-gamified OPPI (G1). This chapter tries to summarise and analyse the empirical data that was gathered during data collection (i.e., pre-, and post-intervention) of this experimental study, thus realising the aim of this research study.

#### 4.1 Sample Statistics

A total of 58 employees were invited to participate in this experimental study. In total, 26 participants ( $n = 26$ ) completed the pre- and post-intervention assessment. This study explored certain demographic characteristics of the participants, specifically gender, age, and occupation. Of the 26 participants, eight participants were female (31%), and majority of the participants were male (69%). Furthermore, the sample was made up of participants in different age groups; 15% of participants were in the 18 to 30 age range, 46% in the 31 to 40 age range, 15% in the 41 to 50 age range, and 23% in the 51 to 60 age range.

The participants represented varied occupations at different hierarchical levels in the organisation, such as administration clerk, executive assistant, brand manager, sales or channel manager, account developer and general manager (GM) of customer. The results found that majority of participants worked as a sales or channel manager (46%) or account developer (38%).

**Table 4. 1***Distribution of Age and Gender in the Sample*

| Age group                 | Gender    |          | Total <sup>a</sup> |
|---------------------------|-----------|----------|--------------------|
|                           | Male      | Female   |                    |
| 18-30                     | 3         | 1        | 4                  |
| 31-40                     | 8         | 4        | 12                 |
| 41-50                     | 3         | 1        | 4                  |
| 51-60                     | 4         | 2        | 6                  |
| <b>Total <sup>a</sup></b> | <b>18</b> | <b>8</b> | <b>26</b>          |

<sup>a</sup>  $N = 26$ .

#### 4.2 Reliability Analysis

To introduce this section, it must be noted that the small sample size ( $n = 26$ ) negatively impacted the statistical significance of the study's results. Therefore, it possible that if the sample size were bigger, the reliability analyses may have yielded more positive and stronger results.

The construct of employee well-being is comprised of three subconstructs, specifically Psychological Well-being (PWB), Subjective Well-being (SWB) and Workplace Well-being (WWB). To ensure the reliability of the employee well-being measure used in this study, the researcher conducted post-intervention reliability analyses of each subconstruct and their relevant subscales. The calculated Cronbach's alpha coefficients ( $\alpha$ ) and item-total correlations were then assessed. A cut-off of  $\alpha > .60$  for the Cronbach's alpha ( $\alpha$ ) and  $r > .30$  for the item-total correlation was deemed acceptable due to the small number of subscales that contributed to the measurement of each subconstruct of employee well-being (Cortina, 1993).

The measures of employee well-being were deemed reliable ( $\alpha = .87$ ), as can be seen in Table 4.2, therefore the subconstructs of employee well-being, PWB, SWB, and WWB, do measure the overarching construct of employee well-being. The item-total correlations of PWB ( $r =$

.71), SWB ( $r = .82$ ) and WWB ( $r = .74$ ) showed that the subscales are strongly correlated, therefore they are measuring the same construct, employee well-being.

**Table 4. 2**

*Reliability Analysis of Employee Well-being*

| Subscale                       | Cronbach's Alpha<br>(95% confidence interval) | Item-total<br>Corr. |
|--------------------------------|---|---------------------|
|                                | 0.87 (0.76, 0.93)                             |                     |
| Psychological Well-being (PWB) |   | 0.71                |
| Subjective Well-being (SWB)    |   | 0.82                |
| Workplace Well-being (WWB)     |   | 0.74                |

$\alpha > .60$  is the cut-off (Cortina, 1993).

The construct of SWB was made up of only two subscales, namely life satisfaction and positive and negative affect. Table 4.3 shows an acceptable level of reliability for the measure of SWB ( $\alpha = .65$ ), therefore the two subscales are acceptable measures of SWB. The item-total correlation values of  $r = .49$  for both sub-scales, were deemed to be an acceptable correlation between the two subscales. Therefore, both sub-scales are in fact related and measure the overarching sub-construct of SWB.

**Table 4. 3**

*Reliability Analysis of Subjective Well-being (SWB)*

| Subscale                     | Cronbach's Alpha<br>(95% confidence interval) | Item-total<br>Corr. |
|------------------------------|---|---------------------|
|                              | 0.65 (0.44, 0.79)                             |                     |
| Life satisfaction            |   | 0.49                |
| Positive and Negative Affect |   | 0.49                |

$\alpha > .60$  is the cut-off (Cortina, 1993).

WWB is made up of work-related affect and job satisfaction. The reliability analysis in Table 4.4 revealed a low Cronbach's alpha ( $\alpha = .26$ ), and low item-total correlations ( $r = .16$ ). Therefore, the two subscales of WWB are not strongly correlated and it can be said that these subscales are not accurately measuring the overarching construct of WWB. In order to, in-part, replicate Page and Vella-Brodrick's (2009) study, the researcher decided to retain the WWBI, but future research should make use of a more reliable scale for workplace well-being.

**Table 4. 4**

*Reliability Analysis of Workplace Well-being (WWB)*

| Subscale            | Cronbach's Alpha<br>(95% confidence interval) | Item-total<br>Corr. |
|---------------------|---|---------------------|
|                     | 0.26 (0.00, 0.60)                             |                     |
| Work-related affect |   | 0.16                |
| Job satisfaction    |   | 0.16                |

$\alpha > .60$  is the cut-off (Cortina, 1993).

The subconstruct of PWB was measured by one scale, which showed a high degree of internal consistency ( $\alpha = .94$ ). Therefore, the scale does in fact measure PWB.

### 4.3 Evaluation of the Gamified Online Positive Psychology Intervention (OPPI)

The following hypotheses were developed based on the research question stated in chapter three to assess the effectiveness of the gamified OPPI to improve employee well-being:

*Hypothesis 1:*

The gamified intervention is more effective than the non-gamified intervention in increasing employee wellbeing.

*Hypothesis 2:*

The gamified intervention is more effective than the non-gamified intervention in increasing subjective well-being (SWB).

*Hypothesis 3:*

The gamified intervention is more effective than the non-gamified intervention in increasing psychological well-being (PWB).

*Hypothesis 4:*

The gamified intervention is more effective than the non-gamified intervention in increasing workplace well-being (WWB).

The research design and chosen statistical analysis technique enabled between-group comparisons across two measurement times (i.e., T1 and T2) by applying the mixed model repeated measure ANOVA in combination with post hoc tests.

Descriptive statistics were used to show the mean differences in employee well-being between time-one (T1) and time-two (T2) for each group. The non-gamified intervention (G1) showed a mean difference of -0.005, therefore there was a decrease in employee well-being from T1 to T2. The gamified intervention (G2) showed a mean difference of 0.0625, therefore there was a small increase in employee well-being. The control group (G3) also showed a slight increase in employee well-being (0.059) from T1 to T2. Therefore, the researcher could not confidently say that the gamified intervention significantly influenced the participant's employee well-being. Further analysis was done below to clarify this.



**Table 4. 5***Descriptive Statistics*

| Group <sup>a</sup> | time     |           |          |           |
|--------------------|----------|-----------|----------|-----------|
|                    | T1       |           | T2       |           |
|                    | <i>M</i> | <i>SD</i> | <i>M</i> | <i>SD</i> |
| <i>G1</i>          | 6,0306   | 0,4221    | 6,0119   | 0,5551    |
| <i>G2</i>          | 5,3148   | 0,8471    | 5,7024   | 0,8133    |
| <i>G3</i>          | 5,5132   | 0,5083    | 5,3197   | 0,6994    |

<sup>a</sup> *N* = 26, *M* = mean, *SD* = standard deviation, *G1* = group 1, *G2* = group 2, *G3* = group 3, *T1* = time-one, *T2* = time-two.

**4.3.1 Employee Well-being**

Table 4.6 demonstrates the results of the mixed model repeated measure ANOVA, which is used to determine whether there is a significant group-by-time effect for employee well-being over two measurement times (i.e., T1 and T2). The post hoc tests performed to find significant differences between group means are shown in Table 4.7. In three groups, the control group (*G3*), the gamified intervention group (*G2*), and the non-gamified intervention group (*G1*), changes in the participant's employee well-being over two measurement intervals are shown graphically in Figure 4.1.

Hypothesis 1 states that the gamified intervention (*G2*) is more effective than the non-gamified intervention (*G1*) in significantly increasing employee well-being and aims to determine if the differences over two measurement times are the same for both groups. Based on hypothesis 1, the experiment should pose a difference in employee well-being between the non-gamified intervention (*G1*) and the gamified intervention (*G2*) at T2. It was predicted that employee well-being would significantly increase from T1 to T2 for participants in the gamified intervention (*G2*)

in comparison to the non-gamified intervention (G1), due to participants in the gamified intervention (G2) being exposed to game elements.

The results in Table 4.6 revealed that the group-by-time interaction effect was not significant for employee well-being ( $p = .69$ ). Although the results were not significant for all three groups, Figure 4.1 and Table 4.7 were also examined to identify trends in the data.

**Table 4. 6**

*Fixed Effect Test for Employee Well-being over Two Measurement Times*

| <b>Effect</b>      | <b>Num DF</b> | <b>Den DF</b> | <b>F value</b> | <b>p value</b> |
|--------------------|---------------|---------------|----------------|----------------|
| group <sup>a</sup> | 2             | 21            | 1.7            | 0.21           |
| time               | 1             | 16            | 0.75           | 0.4            |
| group*time         | 2             | 16            | 0.39           | 0.69           |

<sup>a</sup>  $N = 26$

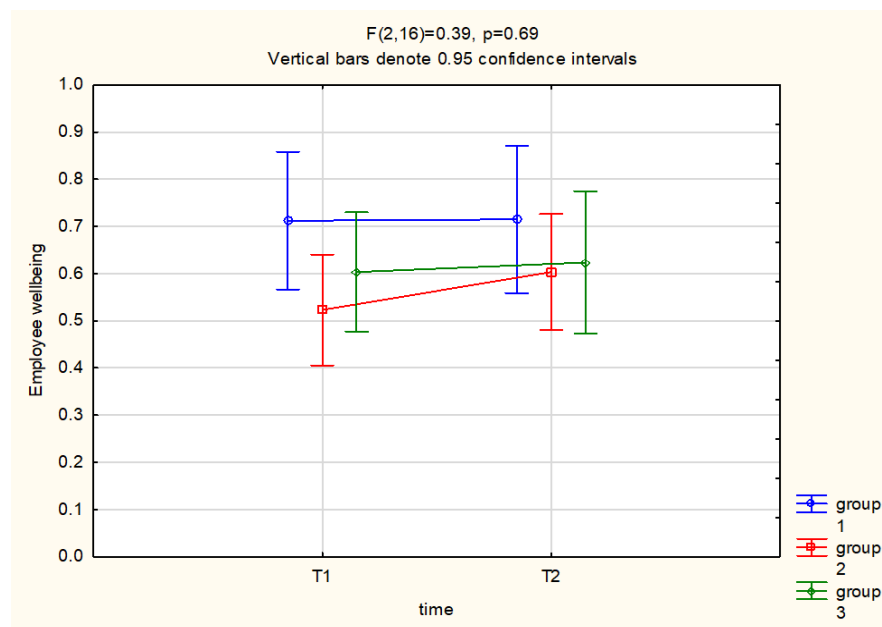
According to Figure 4.1, the non-gamified intervention (G1) and the control group (G3) indicated a relatively stable level of employee well-being from T1 to T2, while the gamified intervention (G2) showed an increase from T1 to T2, and a deviation from parallel lines. Therefore, there was a trend identified that was consistent with the predictions.

Table 4.7 showed a statistically significant difference between the non-gamified intervention (G1) and the gamified intervention (G2) at T1 ( $p=.05$ ), which indicated that participants in the non-gamified intervention (G1) reported a higher level of employee well-being compared to the gamified intervention group (G2) preceding to the intervention. Unfortunately, the increase in employee well-being from T1 to T2 for the non-gamified intervention (G1;  $p =.97$ ) and the gamified intervention (G2;  $p =.25$ ) were insignificant. Therefore, it cannot be concluded that a significant difference exists from T1 to T2. This could be a result of a smaller sample size ( $n = 26$ ) and thus

there was little power in terms of effect size. If the sample size was bigger, the data may have yielded more statistically significant results.

**Figure 4.1**

*Employee Well-being of G1, G2 and G3 at T1 and T2*



Notes.  $N = 26$ , group 1  $n = 7$ ; group 2  $n = 10$ ; group 3  $n = 9$ , T1 = time-one, T2 = time-two.

**Table 4. 7**

*Post Hoc Results for Employee Well-being over Two Measurement Times*

| <b>Post Hoc Tests for EWB over Two Measurement Times</b> |       |      |         |         |         |         |         |         |  |
|--|-------|------|---------|---------|---------|---------|---------|---------|--|
| <b>Effect: Group*time</b>                                |       |      |         |         |         |         |         |         |  |
| Cell No.   | Group | time | {1}     | {2}     | {3}     | {4}     | {5}     | {6}     |  |
|  |       |      | 0.71215 | 0.71503 | 0.52312 | 0.60338 | 0.60356 | 0.62377 |  |
| 1  | 1     | T1   |         | 0.97    | 0.05*   | 0.25    | 0.26    | 0.4     |  |
| 2  | 1     | T2   | 0.97    |         | 0.05*   | 0.26    | 0.27    | 0.4     |  |
| 3  | 2     | T1   | 0.05*   | 0.05*   |         | 0.2     | 0.35    | 0.29    |  |
| 4  | 2     | T2   | 0.25    | 0.26    | 0.2     |         | 1       | 0.83    |  |
| 5  | 3     | T1   | 0.26    | 0.27    | 0.35    | 1       |         | 0.78    |  |
| 6  | 3     | T2   | 0.4     | 0.4     | 0.29    | 0.83    | 0.78    |         |  |

\*  $p < .05$  is significant.

However, the main group effect between the non-gamified intervention group (G1) and the gamified intervention group (G2) was approaching significance ( $p = .08$ ), therefore, suggesting that there was a difference in employee well-being between G1 and G2 over time, and that there was a low probability that the difference was due to random chance. Ultimately, there was partial evidence for hypothesis one and the null hypothesis was rejected.

#### 4.3.2 Subjective Well-being (SWB)

The non-gamified group (G1;  $p = .65$ ), the gamified intervention (G2;  $p = .16$ ), and the control group (G3;  $p = .12$ ) did not differ significantly between T1 and T2, according to Table 4.8, which displayed the group-by-time interaction effects for SWB of all three groups over two measurement intervals. Table 4.9 and Figure 4.2 showed an approaching significant main effect on time ( $p = .07$ ), therefore there were differences between the repeated measures (i.e., at T1 and T2). However, the main group effect for SWB between the non-gamified intervention (G1) and the gamified intervention (G2) was insignificant ( $p = 0.15$ ) indicating no difference in SWB between the groups over time. Figure 4.3 was also examined to clarify these trends.

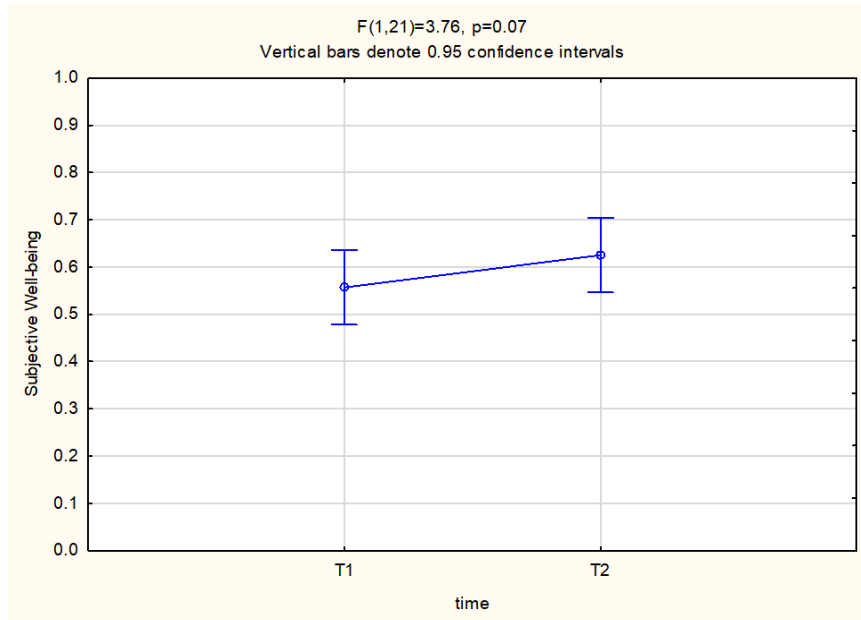
**Table 4. 8**

*Post Hoc Results for SWB over Two Measurement Times*

| <b>Post Hoc Tests for SWB over Two Measurement Times</b> |              |             |                |               |                |                |                |                |
|--|--------------|-------------|----------------|---------------|----------------|----------------|----------------|----------------|
| <b>Effect: Group*time</b>                                |              |             |                |               |                |                |                |                |
| <b>Cell No.</b>  | <b>Group</b> | <b>time</b> | <b>{1}</b>     | <b>{2}</b>    | <b>{3}</b>     | <b>{4}</b>     | <b>{5}</b>     | <b>{6}</b>     |
|  |              |             | <b>0.65856</b> | <b>0.6901</b> | <b>0.50323</b> | <b>0.58723</b> | <b>0.50875</b> | <b>0.59848</b> |
| 1  | 1            | T1          |                | 0.65          | 0.12           | 0.47           | 0.14           | 0.55           |
| 2  | 1            | T2          | 0.65           |               | 0.07           | 0.3            | 0.08           | 0.36           |
| 3  | 2            | T1          | 0.12           | 0.07          |                | 0.16           | 0.95           | 0.29           |
| 4  | 2            | T2          | 0.47           | 0.3           | 0.16           |                | 0.38           | 0.9            |
| 5  | 3            | T1          | 0.14           | 0.08          | 0.95           | 0.38           |                | 0.12           |
| 6  | 3            | T2          | 0.55           | 0.36          | 0.29           | 0.9            | 0.12           |                |

**Table 4. 9***Fixed Effect Test for SWB over Two Measurement Times*

| Effect             | Num DF | Den DF | F value | p value |
|--------------------|--------|--------|---------|---------|
| group <sup>a</sup> | 2      | 22     | 1.27    | 0.3     |
| time               | 1      | 21     | 3.76    | 0.07    |
| group*time         | 2      | 21     | 0.25    | 0.78    |

<sup>a</sup>  $N = 26$ .**Figure 4.2***SWB at T1 and T2*

*Notes.* The time between T1 and T2 was 6-weeks;  $T1$  = time-one,  $T2$  = time- two.

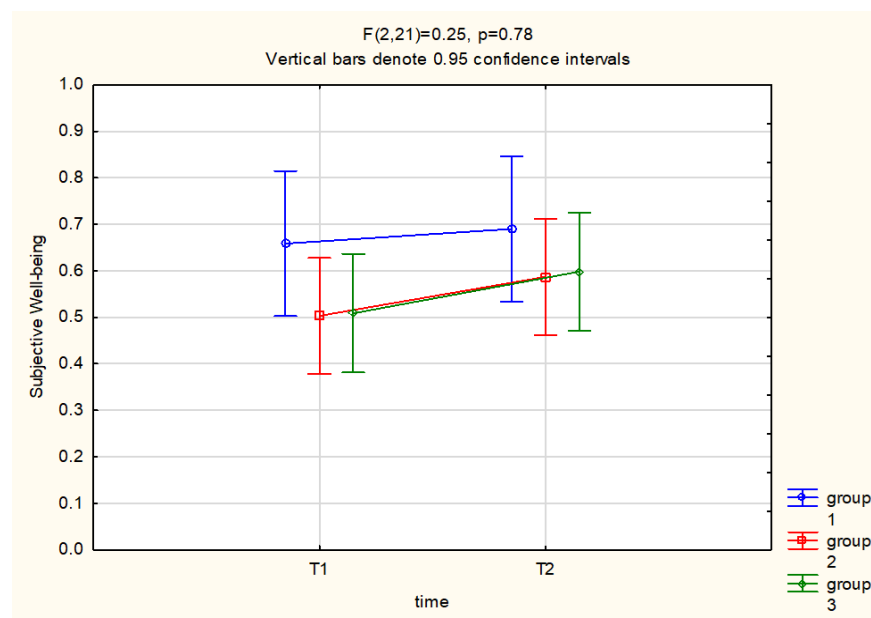
Figure 4.3 illustrated that all three groups showed positive trends from T1 to T2. Additionally, there was a minor deviation between the parallel lines between the non-gamified intervention (G1) and the gamified intervention (G2), but not enough to suggest a meaningful trend in the data.

Figure 4.3 also showed that the control group (G3) also experienced a substantial increase in SWB from T1 to T2, while having no exposure to a treatment. Additionally, the level of SWB

of the gamified intervention (G2) and non-gamified intervention (G1) were noticeably different before the intervention took place ( $p = .12$ ). In interpreting the data, other factors could have influenced SWB among participants, such as genetic, environmental, and relational factors (Keys, 2005).

### Figure 4.3

*SWB of G1, G2 and G3 at T1 and T2*



*Notes.*  $N = 26$ , group 1  $n = 7$ ; group 2  $n = 10$ ; group 3  $n = 9$ ,  $T1$  = time-one,  $T2$  = time-two.

Hypothesis 2 proposed that the level of SWB would significantly increase from T1 to T2 for participants in the gamified intervention group (G2) in comparison to the non-gamified intervention group (G1), due to the gamified intervention group (G2) being exposed to game elements. The researcher could not confidently say that there was a significant difference in SWB between the gamified intervention group (G2) and the non-gamified group (G1) from T1 to T2. Therefore, the second hypothesis was not supported, and the null hypothesis could not be rejected.

### 4.3.3 Psychological Well-being (PWB)

There was a significant group-by-time interaction effect ( $p = .05$ ) for PWB. Tables 4.10 and 4.11 showed a significant difference in PWB between groups at two different measurement times. In addition, Figure 4.4 indicated a trend in the data, with a clear deviation from parallel lines for all groups. The main group effect for PWB between the non-gamified intervention (G1) and the gamified intervention (G2) was approaching significance ( $p = .09$ ), which suggests that there was a difference in PWB overtime, with a low probability of the difference being due to chance. Table 4.11 shows that from T1 to T2, PWB remained relatively stable for the non-gamified intervention group (G1;  $p = .84$ ), PWB increased significantly for the gamified intervention group (G2;  $p = .02$ ), and PWB decreased for the control group (G3;  $p = .23$ ).

**Table 4. 10**

*Fixed Effect Test for PWB over Two Measurement Times*

| <b>Effect</b>      | <b>Num DF</b> | <b>Den DF</b> | <b>F value</b> | <b>p value</b> |
|--------------------|---------------|---------------|----------------|----------------|
| group <sup>a</sup> | 2             | 23            | 2.27           | 0.13           |
| time               | 1             | 20            | 0.58           | 0.46           |
| group*time         | 2             | 20            | 3.62           | 0.05*          |

\*  $p < .05$  is significant, <sup>a</sup>  $N = 26$ .

Hypothesis three predicted that the level of PWB would significantly increase from T1 to T2 for participants in the gamified intervention (G2) in comparison to the non-gamified intervention (G1), due to the gamified intervention (G2) being exposed to game elements. Consequently, the results show that a significant difference exists, therefore, there is support for hypothesis three and the null hypothesis was rejected.

**Table 4. 11**

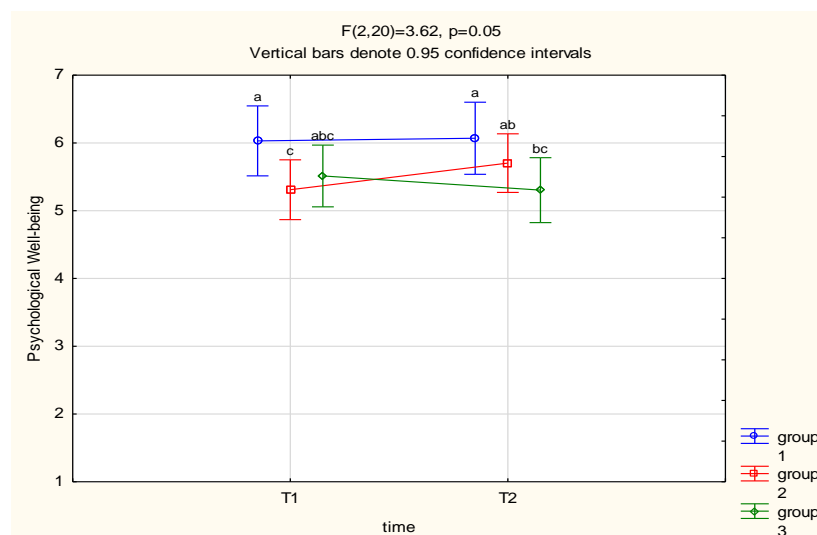
*Post Hoc Results for PWB over Two Measurement Times*

| Post Hoc Tests for PWB over Two Measurement Times |       |      |        |        |        |        |        |        |
|---|-------|------|--------|--------|--------|--------|--------|--------|
| Effect: Group*time                                |       |      |        |        |        |        |        |        |
| Cell No.  | Group | time | {1}    | {2}    | {3}    | {4}    | {5}    | {6}    |
|   |       |      | 6.0306 | 6.0691 | 5.3097 | 5.7024 | 5.5132 | 5.3037 |
| 1   | 1     | T1   |        | 0.84   | 0.04*  | 0.33   | 0.13   | 0.04*  |
| 2   | 1     | T2   | 0.84   |        | 0.03*  | 0.28   | 0.12   | 0.04*  |
| 3   | 2     | T1   | 0.04*  | 0.03*  |        | 0.02*  | 0.52   | 0.99   |
| 4   | 2     | T2   | 0.33   | 0.28   | 0.02*  |        | 0.54   | 0.22   |
| 5   | 3     | T1   | 0.13   | 0.12   | 0.52   | 0.54   |        | 0.23   |
| 6   | 3     | T2   | 0.04*  | 0.04*  | 0.99   | 0.22   | 0.23   |        |

\*  $p < .05$  is significant.

**Figure 4.4**

*PWB of G1, G2 and G3 at T1 and T2*



Notes.  $N = 26$ , group 1  $n = 7$ ; group 2  $n = 10$ ; group 3  $n = 9$ , T1 = time-one, T2 = time-two.

#### 4.3.4 Workplace Well-being (WWB)

The results in Table 4.12 revealed a non-significant group-by-time interaction effect ( $p = .65$ ) for the three groups, so there were no significant differences in group means for WWB over



two measurement times. The main group effect (Table 4.13) between the non-gamified intervention (G1) and the gamified intervention (G2) was insignificant ( $p = .12$ ), therefore there was no difference in group means across time. Figure 4.5 was examined to clarify certain trends in the data.

**Table 4. 12**

*Fixed Effect Test for WWB over Two Measurement Times*

| Effect             | Num DF | Den DF | F value | p value |
|--------------------|--------|--------|---------|---------|
| group <sup>a</sup> | 2      | 21     | 1.72    | 0.2     |
| time               | 1      | 20     | 0.88    | 0.36    |
| group*time         | 2      | 20     | 0.45    | 0.65    |

\*  $p < .05$  is significant, <sup>a</sup> $N = 26$ .

**Table 4. 13**

*Post Hoc Results for WWB of Three Groups*

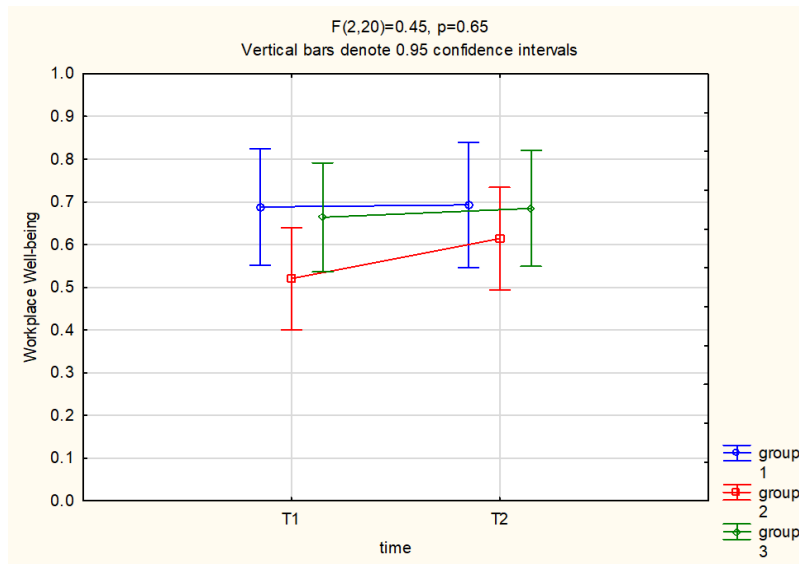
| Post Hoc Results for WWB of Three Groups |       |                |                |               |
|--|-------|----------------|----------------|---------------|
| Main Group Effect                        |       |                |                |               |
| Cell No.                                 | Group | {1}            | {2}            | {3}           |
|  |       | <b>0.69075</b> | <b>0.56726</b> | <b>0.6745</b> |
| 1  | 1     |                | 0.12           | 0.84          |
| 2  | 2     | 0.12           |                | 0.15          |
| 3  | 3     | 0.84           | 0.15           | 12            |

In Figure 4.5, there was a deviation from parallel lines between the non-gamified intervention (G1) and the gamified intervention (G2), which suggested a trend in the data. Table 4.14 and Figure 4.5 showed that the non-gamified intervention (G1;  $p = .95$ ) and the control group (G3;  $p = .78$ ) indicated a relatively stable level of WWB from T1 to T2, but the gamified intervention (G2) indicated an increase in WWB from T1 to T2, albeit an insignificant increase ( $p = .18$ ). The

smaller sample size ( $N = 26$ ) led to a small effect size. Therefore, if the sample size was larger, the experiment could have yielded more significant results.

**Figure 4.5**

*WWB of G1, G2 and G3 at T1 and T2*



Notes.  $N = 26$ , group 1  $n = 7$ ; group 2  $n = 10$ ; group 3  $n = 9$ ,  $T1$  = time-one,  $T2$  = time-two.

**Table 4. 14**

*Post Hoc Results for WWB over Two Measurement Times*

| Post Hoc Tests for WWB over Two Measurement Times |       |      |                |                |               |                |               |               |
|---|-------|------|----------------|----------------|---------------|----------------|---------------|---------------|
| Effect: Group*time                                |       |      |                |                |               |                |               |               |
| Cell No.  | Group | time | {1}            | {2}            | {3}           | {4}            | {5}           | {6}           |
|   |       |      | <b>0.68831</b> | <b>0.69319</b> | <b>0.5203</b> | <b>0.61423</b> | <b>0.6641</b> | <b>0.6849</b> |
| 1   | 1     | T1   |                | 0.95           | 0.07          | 0.41           | 0.79          | 0.97          |
| 2   | 1     | T2   | 0.95           |                | 0.07          | 0.4            | 0.76          | 0.93          |
| 3   | 2     | T1   | 0.07           | 0.07           |               | 0.18           | 0.1           | 0.07          |
| 4   | 2     | T2   | 0.41           | 0.4            | 0.18          |                | 0.57          | 0.43          |
| 5   | 3     | T1   | 0.79           | 0.76           | 0.1           | 0.57           |               | 0.78          |
| 6   | 3     | T2   | 0.97           | 0.93           | 0.07          | 0.43           | 0.78          |               |

Hypothesis four predicted that the level of WWB would significantly increase from T1 to T2 for participants in the gamified intervention group (G2) in comparison to the non-gamified intervention group (G1), due to the gamified intervention (G2) being exposed to game elements. Although the researcher cannot conclude that a significant difference exists, there is a trend in the data that could have led to a significant result if a larger sample size was used. Therefore, hypothesis four was partially supported and the null hypothesis was rejected.

#### **4.4 Summary**

The results showed partial support for hypothesis one, therefore there was evidence to support the possibility that the increase in employee well-being of the gamified intervention group (G2) was attributed to gamification to some extent. There was also evidence to support the possibility that the increase in PWB and WWB of the gamified intervention group (G2) was attributed to gamification to some extent. Unfortunately, there was no support for the possible relationship between the increase in SWB of the gamified intervention group (G2) and gamification. This was likely due to participant's having experienced other factors that influenced their SWB, such as genetic, environmental, and relational factors (Keyes, 2005) before or during the study. In terms of effect size, the small sample size ( $n = 26$ ) yielded little power, therefore if the sample size had been larger, the study may have yielded more statistically significant results.

## **Chapter 5**

### **Discussion**

In the last decade, there has been a universal movement to focus on promoting health and well-being in the workplace (Johnson, et al., 2016). Even more so after the outbreak of the COVID-19 pandemic, which has accelerated the decline in employees' mental health, due to isolation, minimal interpersonal interaction, and other circumstantial threats to mental health (Hou et al., 2020). Such research has highlighted the need for health and well-being initiatives that are aimed at increasing employee well-being (Mind, 2021). In contrast to the evident need for health and well-being initiatives in the workplace, participation in such interventions has historically been incredibly low (Poole et al., 2001; Howarth et al., 2018). Edwards (2012) found that attrition in employee health and well-being interventions was strongly correlated to a lack of personal motivation to participate in health and well-being interventions and increased levels in boredom during the interventions. Therefore, there is also a need for organisations to implement innovative strategies, such as gamification, which has the potential to increase the motivation to participate, and reduce boredom in employee well-being interventions (Edwards, 2012; Johnson et al., 2016), thus potentially enhancing the outcomes of such interventions. Unfortunately, there is a dearth of concrete research showing how gamification might improve the results of employee well-being initiatives (Ahtinen et al., 2013; Hall et al., 2013; Ludden et al., 2014; Johnson et al., 2016). Therefore, the aim of this research study was to conduct a controlled field experiment to explore the efficacy of gamification in an OPPI aimed at increasing employee well-being.

The primary findings of this study are presented in this chapter along with comparisons to related literature that has already been published. Following that, this chapter discusses the primary findings' practical ramifications, shortcomings, and recommendations for further study.

## 5.1 Key Findings

This study was exploratory, but also replicated and extended components of Page and Vella-Brodrick's (2013) study on the effectiveness of the Working for Wellness Programme. Therefore, a brief comparison of the research design and findings of the current investigation with those of the aforementioned study will be covered in this section.

The sample ( $N = 26$ ) for this study was divided into two experimental groups (Group 1;  $n = 7$ , and Group 2;  $n = 10$ ) and a control group (Group 3;  $n = 9$ ). Whereas Page and Vella-Brodrick (2013) had a larger sample ( $N = 37$ ) that was made up of one experimental group ( $n = 23$ ) and a control group ( $n = 14$ ). Group 1 (G1;  $n = 7$ ) was the non-gamified OPPI group, where participants participated in the 6-week intervention, called the Working for Wellness Programme (i.e., the OPPI) designed by Page and Vella-Brodrick (2009). Group 2 (G2;  $n = 10$ ) was the gamified OPPI group, where participants were exposed to shallow gamification, namely feedback systems, progress paths and badges. G1 and G2 completed the OPPI over the same six-week period, while the control group (G3;  $n = 9$ ) received no intervention for those six weeks. All participants were measured on their level of employee well-being (i.e., their psychological well-being (PWB), subjective well-being (SWB) and workplace well-being (WWB)) in the week before the intervention (T1) began, and immediately upon completion of the intervention (T2). The control group and the implementation of the intervention for the non-gamified group (G1), as well as the data collection process at T1 and T2 was a replication of Page and Vella-Brodrick's (2013) study.

However, the incorporation of gamification in the Working for Wellness Programme for the gamified OPPI group (G2) has not been done or tested before, and therefore was the exploratory component of this research study.

Four hypotheses were tested regarding the effect of the gamified versus the non-gamified intervention on the three constructs that make up employee well-being. The results are discussed in relation to existing research below.

### ***5.1.1 The Effect of the Gamified OPPI on Employee Well-Being***

The first hypothesis proposed that the gamified intervention would be more effective than the non-gamified intervention in increasing employee well-being. While the results were not significant, there was partial support for the efficacy of gamification in an OPPI aimed at increasing employee well-being based on the main group effect ( $p = .08$ ) between the gamified intervention group (G2) and non-gamified intervention group (G1) and the main effect on time of G2 ( $p = .25$ ). Therefore, the implementation of shallow gamification may, with a larger sample, be sufficient to elicit the desired results.

In a study of mental well-being training by Ahtinen et al. (2013), which involved techniques to stimulate changes in unfavourable thought patterns and beliefs, just over half the users were sceptical about gamification. Although mental well-being increased, the participants suggested that points and rewards systems were a poor fit in the context of mental well-being training (Ahtinen et al., 2013). Similarly, shallow gamification was used in this study in the form of feedback systems, individual and group progress paths, as well as virtual badges to intrinsically motivate the participants. Given the results obtained, it can be suggested that the game elements implemented in the OPPI are a good fit in the context of employee well-being.

Partial support for the first hypothesis is comparable to research conducted by Ludden et al. (2014), which evaluated an online gamified training intervention that was aimed at enhancing the mental health and well-being of primary school teachers. The training intervention incorporated game elements, such as challenges, levels, and a progress map (Ludden et al., 2014). Although no comparison study was undertaken, Ludden et al. (2014) reported positive findings, and the participants stated that the game aspects encouraged them to complete the training by making it tough, but enjoyable. Given the partial support for hypothesis 1, it can be suggested that, with a larger sample, the implementation of game elements may provoke participants to engage in the intervention more. Thus, contributing to the understanding that gamification has the potential to harness its motivational affordances to enhance behavioural and psychological outcomes of well-being interventions (Tolks, et al., 2019).

Additionally, the current study's findings are related to research conducted by Johnson et al. (2016). The systematic review of twenty-one studies reported that the majority of cases (59%) demonstrated positive effects of gamified interventions on health and well-being, with a significant percentage (41%) of the studies demonstrating neutral or mixed effects and none of the studies demonstrating purely negative effects (Johnson et al., 2016). The results of these studies provided empirical evidence that gamification does have a positive impact on general health and well-being, however, the efficacy of gamification was only demonstrated in studies relating to health behavioural outcomes, such as physical activity, substance abuse and eating habits (Johnson et al., 2016). Thus, the trends toward significance observed in this study for the efficacy of gamification in a well-being OPPI has contributed to related research on the topic of the efficacy of gamification, specifically in the employee well-being domain.

### 5.1.2 *The Effect of the Gamified OPPI on SWB, PWB and WWB*

The second, third and fourth hypotheses were formulated to assess the effectiveness of gamification in increasing SWB, PWB, and WWB, respectively. The main group effect between the non-gamified intervention group (G1) and the gamified intervention group (G2) for SWB ( $p = .15$ ), for PWB ( $p = .09$ ) and for WWB ( $p = .12$ ) were not significant but showed partial support. Therefore, it was suggested that participants in the gamified intervention group (G2) experienced more positive PWB, SWB and WWB than those in the non-gamified intervention group (G1). Consequently, hypotheses 3 and 4 were partially supported, but hypothesis 2, which proposed that the gamified intervention would be more effective than the non-gamified intervention in increasing subjective well-being (SWB) could not be supported. In essence, the increase observed in the control group's (G3) level of SWB in comparison to the experimental groups (G1 and G2) was not significant.

Page and Vella-Brodrick's (2013) study reported that participants in the experimental group showed substantial increases in PWB, SWB and work-related affective well-being (AWB), whereas participants in the control group did not. The authors suggested that changes in well-being were a result of the Working for Wellness Programme and not due to external factors. Furthermore, the study's results revealed a significant group-by-time interaction for PWB ( $F_{3,17} = 1.03, p < .05$ ), and for SWB ( $F_{3,18} = 4.87, p < .01$ ) (Page & Vella-Brodrick, 2013). As a result, from time one (T1) to time four (T4), participants in the experimental group had significantly higher PWB and SWB than did those in the control group. In the current study, the main group effect between the non-gamified intervention group (G1) and the control group (G3) showed support for PWB ( $p = .06$ ), but none for SWB ( $p = .19$ ). Therefore, it is suggested that participants in the non-gamified



intervention group (G1) experienced higher levels of PWB than those in the control group (G3), which offers some support for Page and Vella-Brodrick's (2013) findings.

Page and Vella Brodrick's (2013) study's results also revealed no significant group-by-time interaction effect for work-related well-being (i.e., WWB), which is made up of workplace well-being and work-related affective well-being (AWB). This is due to a decrease in workplace well-being of participants in the intervention and control groups across time. In the current study, the main group effect for WWB ( $p = .84$ ) between the non-gamified intervention group (G1) and the control group (G3) was not significant. Therefore, the researcher is unable to state with certainty that individuals in the non-gamified intervention group (G1) suffered more WWB than those in the non-gamified intervention group (G3) over time. The current study found that the two subscales of WWB were not strongly correlated and therefore was not a reliable measure in this sample, which could have influenced the results of the current study.

As shown above, the results of the current study are comparable or related to previous research on employee well-being and gamification in the health and well-being domain, which contributes to the limited understanding on the efficacy of gamification in the employee well-being domain. The findings suggest that there was a trend towards a possible relationship between the effectiveness of gamification in enhancing the outcomes of employee well-being interventions, and if a larger sample was recruited it is possible that more compelling support for the hypotheses may have been observed.

## **5.2 Practical implications**

The current exploratory study has several implications for organisations, managers, human resource practitioners, as well as employees. It is crucial to remember that the following practical

implications that are discussed here are based on the current study's results, which would be more significant if this study was repeated on a larger sample.

Firstly, the experiment was conducted during the COVID-19 pandemic, which has had a wide-ranging impact on the world, but the impact on mental health has garnered the most attention. In a poll done by Mind (2021) in June 2020, it was discovered that more than half of the participants said their mental health had worsened since the lockdown restrictions started. Business in the Community (2020) released the Mental Health at Work 2020 report in October of that year, and it found that 51% of employees had poor mental health as a result of work-related stress, and 41% of employees experienced mental health symptoms that were brought on by or made worse by their jobs. Research suggests that the COVID-19 pandemic has accelerated the decline in mental health, because employees experienced isolation, minimal interpersonal interaction, and other circumstantial threats to mental health (Hou et al., 2020). Such research has highlighted the need for health and well-being initiatives that are aimed at increasing employee well-being (Mind, 2021).

Based on the increase in employee well-being for participants in the gamified intervention and non-gamified intervention, the current study supported Page and Vella-Brodrick's (2013) assertions that employees can learn effective strategies from PPIs to improve their general and workplace well-being. In addition, the current study's results revealed that there was partial evidence supporting that a gamified OPPI was more effective than a non-gamified OPPI in increasing employee well-being. These results suggest that online positive psychology interventions (OPPIs) at an individual level, can have a positive impact on general and workplace well-being. This shows practical assurance for organisations that promote employee well-being or

that wish to promote employee well-being, as well as human resource practitioners driving such initiatives.

Chenoweth and Hochberg (2009) stated that in order to ensure the success of its health and well-being initiatives organisations must do the following; create an organisational culture that promotes health and well-being, ensure there is alignment between the core values of the organisation and the human resource practitioner's goals for health and well-being in the workplace, collaborate with internal and external partners to provide quality employee-focused health and well-being initiatives, and ensure that the initiatives are accessible to every employee (Chenoweth & Hochberg, 2009). Results from the current study are important from a practical perspective, as it suggests that the OPPI used in the current study was an effective, and employee-centric initiative. Individual-level OPPIs may also be more cost-effective and time-sensitive than onsite, organisation-wide initiatives for many organisations limited by time or budget (Amichai-Hamburger et al., 2014). Additionally, the nature of an Online PPI may be more accessible to employees (Amichai-Hamburger et al., 2014). The current study delivered the intervention via Microsoft Teams, which allowed participants, specifically the sales representatives who travel extensively, to join while in the field either from the client's premises or in their car.

Chenoweth (2011) also stated that for health and well-being initiatives to be successful, management must demonstrate their support. Management influences the level of employee engagement in health and well-being interventions, and, in many workplaces, management can adapt employees work schedules to accommodate employee participation in health and well-being initiatives (Gilbreath & Benson, 2004). Feedback from participants in the current study suggest that support and participation from top to middle-level management in the OPPI may increase employee participation and engagement in the intervention. The current study's sample consisted of

employees from different hierarchical levels in the organisation, however majority of the participants were Sales Managers (46%), which showed visible support of the initiative from middle-management. Additionally, the Director of Sales was the initial organisational representative who agreed to participate in the study and encouraged participation from other employees. This also showed support for the initiative from top-level management. Feedback from the participants also confirmed this, as several participants expressed that they were happy to see management participating in the intervention, because it shows that they are invested in creating an organisational culture that promotes the health and well-being of its employees.

Employee engagement in an organisation's health and well-being efforts must be created and maintained if the organisation is to meet its health and well-being management goals (Chapman, 2006). It is the human resource practitioner's role to drive the health and well-being initiatives, therefore it is also their role to boost participation in such interventions. This is often done by offering the appropriate incentives to motivate employees to participate in the interventions (Chenoweth, 2011). Surveys suggest that financial incentives, such as gift cards and cash incentives, as well as merchandise gifts are the most effective in motivating employees to participate in interventions that aim to change health behaviours, however there is no long-term effect (Robison, 1998). For the best outcome, research suggests implementing a combination of financial and non-financial rewards (Chenoweth, 2011). However, there are legal and ethical considerations that human resource practitioners must consider when establishing an incentive plan for health and well-being initiatives (Chenoweth, 2011). From an ethical standpoint, it is recommended that practitioners should not use financial incentives to extrinsically motivate employees to participate in an intervention that aims to improve their mental well-being and should instead look to implement intrinsic motivators, because intrinsic motivators lead to eudemonic behaviours that predict mental

well-being (Csikszentmihalyi, 1975). Additionally, in a study of mental well-being, the participants suggested that points and rewards systems were a poor fit for mental well-being training, because they extrinsically motivate participants and promote competition between participants (Ahtinen et al., 2013). The results of the current study showed partial support for the efficacy of gamification in well-being OPPIs, which suggested that the game elements used in this study, specifically progress paths and virtual badges, were a good fit. Therefore, practitioners can implement certain game elements that intrinsically motivate participants to engage in health and well-being interventions.

Lastly, from an organisational perspective, research shows that increasing employees' workplace well-being can increase performance and reduce employee turnover, therefore reducing the ongoing cost of recruitment and training, it can also reduce absenteeism, therefore improving productivity and reducing organisational costs associated with unwell employees (Pogrebtsova et al., 2017). From an employee's perspective, increasing workplace well-being can lead to an increase in self-esteem, job satisfaction, morale, productivity, and engagement between colleagues (Merino de Paz, 2013). Although the current study does not measure such outcomes, the current study's results still hold practical importance for the implementation of employee well-being interventions, such as the one in the current study.

### **5.3 Limitations of the Study and Recommendations for Future Research**

There are a number of limitations that have been found that might have affected this study's findings. It is important to address these limitations and provide recommendations for future research. Firstly, this study was an exploratory research study aimed at bridging the gap in research on the topic of the effectiveness of gamification in interventions aimed at increasing employee

well-being. Therefore, the lack of research in this area of study (Johnson et al., 2016) was the most significant challenge for the researcher, but the most rewarding when the results showed some support for the possibility that the gamified intervention was more effective in increasing employee well-being than the non-gamified intervention. The researcher encourages more exploratory research in this area of study, as well as replication studies of the current study.

Moreover, there were constraints regarding the intervention and the instruments used in the study. Firstly, it was a challenge for the researcher to get permission to use an established and effective well-being intervention, however the researcher was able to get permission from Dr Katherine Page to use the Working for Wellness Programme (Page & Vella-Brodrick, 2009). Although the intervention was developed twelve years ago, the current study's results showed an increase in employee well-being for both the non-gamified and gamified intervention groups, which supported Page and Vella-Brodrick's (2013) results and indicated that the intervention is still effective. Furthermore, only shallow gamification was incorporated into the intervention due to a lack of resources available to the researcher. However, there was partial support for the efficacy of gamification in employee well-being interventions. Although shallow gamification is more cost-effective (Lopes et al., 2019), it is recommended that future research should attempt to implement deep gamification to determine the possibility of more significant results on the outcomes of employee well-being interventions. Additionally, future research should attempt to collect qualitative data on the effectiveness of the game elements used in the implementation of gamification.

Next, there was a weakness in one of the instruments used in the attempt to replicate Page and Vella-Brodrick's (2009) study. The current study's reliability analysis found that the Workplace Well-Being (WWB) scale did not reliably measure the construct of WWB ( $\alpha = .26$ ) in this sample. This could have contributed to the fact that the results only showed partial support for the

efficacy of gamification in the employee well-being intervention. The reliability analysis also showed that the construct of WWB significantly contributes to the overall factor of employee well-being, therefore, it is recommended that future research removes items in the scale with low Cronbach's alphas ( $\alpha = .30$ ) to increase internal consistency of the WWB scale.

Another limitation was the study's small sample size ( $N = 26$ ). This could have contributed to the absence of statistical support for three of the hypotheses. The experimental design, and a lack of resources inhibited the number of employees that could participate in the study. Page and Vella-Brodrick's (2013) study had a larger sample size ( $N = 60$ ) that could account for the significant results reported in their study. Therefore, a larger sample size should be used to study the effectiveness of gamification in well-being OPPIs in order to replicate and further our understanding of gamified interventions. Part of the reason the sample size was smaller was because some of the participants did not use the same cell-phone number when completing the pre- and post-intervention assessments, therefore the researcher could not use their data. It is recommended that a different unique identifier be used in future research, and the researcher should assign each participant with their identifier before the pre-intervention assessment, and again before the post-intervention assessment.

The next constraint was the challenging conditions that the study was conducted under. The experiment was conducted during the chosen organisation's 'busy season', which is characterised by longer working hours, and increased pressure to achieve sales targets by the end of their financial year. Additionally, the intervention was conducted during the COVID-19 pandemic, during which a significant number of employees experienced a decline in their mental health caused or aggravated by work (Mind, 2021). These conditions could have contributed to the observed

results for employee well-being, SWB, PWB and WWB. The current study was restricted by a lack of resources and time constraints, however, it is recommended that future research be conducted outside of their chosen organisation's 'busy season', and when there are less stressors caused by the COVID-19 pandemic, as well as ensure that the sample consists of employees from all departments to represent the chosen organisation more accurately.

Higher levels of stress also could have contributed to the less substantial increases in employee well-being, SWB, PWB and WWB. Research has shown that certain demographic factors have shown to impact stress levels (Kuehner-Hebert, 2020), thus demographic factors could have also played a role. In this study majority of participants were managers (46%) and were from the sales and marketing departments, which traditionally consist of the most stressful jobs (Rumbauskas, 2017). Research also states that women experience higher levels of workplace stress in comparison to men, and millennials experience higher levels of workplace stress in comparison to older generations (Kuehner-Hebert, 2020). In this study, 69% of the participants were male, therefore this would not have been a high contributing factor for the lack of support of the hypotheses. However, 46% of the sample was aged 31 to 40 years old, which falls into the millennial age category and could have contributed to the insignificant results.

Lastly, future research should also examine the effectiveness of gamification in well-being OPPIs in comparison to other organisational outcomes, such as performance and the bottom line. This would add to the practical implication of gamified OPPIs.

## **5.4 Conclusion**

The aim of this exploratory research was to conduct a controlled field experiment to investigate the efficacy of gamification in an OPPI aimed at increasing employee well-being.



Despite the limitations, this study revealed some support for the effectiveness of gamification in increasing the observed outcomes of the Working for Wellness Programme used in this study. Therefore, this study successfully identified an effective and innovative strategy that can be used to enhance the outcomes of employee well-being interventions.

As demonstrated in the literature review, gamification can be used to increase engagement and motivation to participate in employee well-being interventions (Lopes et al., 2019), thus enhancing the expected outcomes of interventions. The researcher believes that future replication studies, with larger samples sizes, will likely lead to the possibility of stronger evidence, which will add to the practical consequence of this study and hopefully influence organisations and HR practitioners to implement gamified employee well-being initiatives. In doing so, organisations, as well as their employees will reap the benefits associated with increased levels of employee well-being.

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## Appendix A.

### Notice of Approval



#### NOTICE OF APPROVAL

REC: Social, Behavioural and Education Research (SBER) - Initial Application Form

14 September 2021

Project number: 23320

Project Title: INVESTIGATING THE EFFICACY OF GAMIFICATION IN AN ONLINE POSITIVE PSYCHOLOGY INTERVENTION (OPPI) AIMED AT INCREASING EMPLOYEE WELL-BEING

Dear Miss A Mckinley

**Co-investigators:**

Your REC: Social, Behavioural and Education Research (SBER) - Initial Application Form submitted on 10/09/2021 11:57 was reviewed and approved by the REC: Social, Behavioural and Education Research (REC: SBE).

Please note below expiration date of this approved submission:

**Ethics approval period:**

| Protocol approval date (Humanities) | Protocol expiration date (Humanities) |
|-------------------------------------|---------------------------------------|
| 14 September 2021                   | 13 September 2022                     |

**GENERAL REC COMMENTS PERTAINING TO THIS PROJECT:**

**INVESTIGATOR RESPONSIBILITIES**

Please take note of the General Investigator Responsibilities attached to this letter. You may commence with your research after complying fully with these guidelines.

**If the researcher deviates in any way from the proposal approved by the REC: SBE, the researcher must notify the REC of these changes.**

Please use your SU project number (23320) on any documents or correspondence with the REC concerning your project.

Please note that the REC has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.

**CONTINUATION OF PROJECTS AFTER REC APPROVAL PERIOD**

You are required to submit a progress report to the REC: SBE before the approval period has expired if a continuation of ethics approval is required. The Committee will then consider the continuation of the project for a further year (if necessary).

Once you have completed your research, you are required to submit a final report to the REC: SBE for review.

**Included Documents:**

| Document Type                 | File Name                         | Date       | Version |
|-------------------------------|-----------------------------------|------------|---------|
| Data collection tool          | Measurement Instruments           | 04/08/2021 | 1       |
| Proof of permission           | Permission Letter for WWBI        | 05/08/2021 | 1       |
| Letter of support_counselling | SAFMH                             | 03/09/2021 | 1       |
| Letter of support_counselling | SADAG                             | 03/09/2021 | 1       |
| Recruitment material          | Participant recruitment letter    | 06/09/2021 | 2       |
| Informed Consent Form         | Consent Form                      | 06/09/2021 | 3       |
| Letter of support_counselling | Counsellor Communications         | 06/09/2021 | 3       |
| Request for permission        | Organisation Recruitment Letter   | 06/09/2021 | 2       |
| Proof of permission           | Permission to use WWBI            | 06/09/2021 | 1       |
| Data collection tool          | Workplace-Wellbeing-Index         | 06/09/2021 | 1       |
| Research Protocol/Proposal    | A McKinley Research Proposal 2021 | 07/09/2021 | 2       |
| Default                       | RESPONSE LETTER REC               | 07/09/2021 | 2       |

If you have any questions or need further help, please contact the REC office at [cgraham@sun.ac.za](mailto:cgraham@sun.ac.za).

Sincerely,

Clarissa Graham

REC Coordinator: Research Ethics Committee: Social, Behavioral and Education Research

*National Health Research Ethics Committee (NHREC) registration number: REC-050411-032.  
The Research Ethics Committee: Social, Behavioural and Education Research complies with the SA National Health Act No.61 2003 as it pertains to health research. In addition, this committee abides by the ethical norms and principles for research established by the Declaration of Helsinki (2013) and the Department of Health Guidelines for Ethical Research: Principles Structures and Processes (2<sup>nd</sup> Ed.) 2015. Annually a number of projects may be selected randomly for an external audit.*

## Appendix B.

### Consent Form



UNIVERSITEIT • STELLENBOSCH • UNIVERSITY  
jou kennisvenoot • your knowledge partner

#### **STELLENBOSCH UNIVERSITY CONSENT TO PARTICIPATE IN RESEARCH**

---

You are invited to take part in a study conducted by Amy McKinley (Masters Student) from the Department of Industrial Psychology at Stellenbosch University. The results of this study will contribute to the master's Research of Amy McKinley. You were approached as a possible participant, because you are currently working at the organisation that agreed to participate in this study.

#### **1. PURPOSE OF THE STUDY**

This study aims to contribute research to the health and well-being domain, specifically on the topic of improving employee well-being in a South African context.

Employees are considered one of the most valuable resources in an organisation, therefore organisations must ensure the well-being of their employees through the implementation of employee well-being interventions. Additionally, organisations must be innovative to find ways to increase motivation and engagement in employee well-being interventions to realise the employee and organisational benefits associated with the intervention.

#### **2. PROCEDURES**

If you agree to participate in this study, you will be randomly assigned to an experimental group, where you will participate in a 6-week Online Positive Psychology Intervention (OPPI) called the



Working for Wellness Programme. All groups will start at different times, and you will be informed via email when you will begin. Whichever group you are assigned to, you will get the opportunity to participate in the in the OPPI.

Before each group starts the OPPI, you will be requested to complete an online survey to determine your current state of employee well-being. In this process, you will be asked to use your cell phone number as an identifier, which will then be deleted and replaced with an unidentifiable code once the data is exported. These measures are put in place to ensure that your identity is protected and that your data remains confidential. It is important to note that the use of an identifier is only used so that the researcher can link your responses from time-one to time-two.

Once the OPPI begins, each week you will participate in a one-hour group session, where specific topics will be discussed, and you will be asked to complete short exercises for the next week. After the 6-week OPPI you will be asked to complete the same online survey again immediately upon completion.

### **3. POTENTIAL RISKS AND DISCOMFORTS**

Some questions in the survey may cause you to experience negative emotions. If you are feeling emotional distress and require counselling, please make use of the following organisational and external resources:

- South African Depression and Anxiety Group (SADAG) Mental Health Line: (011) 234 4837
- The South African Federation for Mental Health (SAFMH): (011) 781 1852

### **4. POTENTIAL BENEFITS TO SUBJECTS AND/OR TO SOCIETY**

Participants can benefit from this study, as they will experience an increase in subjective well-being, psychological well-being, and workplace well-being. Thus, experiencing increased satisfaction in life, increased positive emotions, and decreased negative emotions, increased job satisfaction, and increased work-related positive emotions.

Additionally, this research will also benefit the organisation in which the participants work, as it aims to increase the participants' employee well-being, thereby increasing their productivity and reducing employee turnover.

## **5. PAYMENT FOR PARTICIPATION**

Participants will receive no payment for participating in this study, but by virtue of the tried and tested OPPI, The Working for Wellness Programme, which will be implemented, the participants will experience an increase in their state of employee well-being, which is extremely beneficial.

## **6. CONFIDENTIALITY**

Any information that is obtained in connection with this study and that can be identified with you will remain confidential and will be disclosed only with your permission or as required by law. Confidentiality will be maintained by restricting access to the data to the researcher (Amy McKinley), her supervisor (Dr Samantha Adams), and a data analyst (Professor Kidd). All parties will only receive the data once signing a non-disclosure agreement (NDA). Your data will be stored on a password protected computer, password protected online platform (OneDrive) and by only reporting aggregate statistics of the sample. A summary of the findings may be presented to the respective organisation, but the identity of participants will remain confidential.

## **7. PARTICIPATION AND WITHDRAWAL**

You can choose whether to be in this study or not. If you volunteer to be in this study, you may withdraw at any time without consequences of any kind. You may also refuse to answer any questions you do not want to answer and remain in the study. The investigator may withdraw you from this research if circumstances arise which warrant doing so.

To ensure that this research is a meaningful contribution, the researcher would request that if you do decide to refuse to answer certain questions that she would still be able to use your aggregated data. Additionally, if you withdraw from the study, the researcher would like to obtain permission to conduct a follow-up interview to gain more insights that could be helpful during interpretation of the data.

## **8. IDENTIFICATION OF INVESTIGATORS**

If you have any questions or concerns about the research, please feel free to contact Amy McKinley (0825640128 or amyrosebud2@gmail.com).

## **9. RIGHTS OF RESEARCH SUBJECTS**

You may withdraw your consent at any time and discontinue participation without penalty. You are not waiving any legal claims, rights, or remedies because of your participation in this research study. If you have questions regarding your rights as a research subject, contact Ms Maléne Fouché [mfouche@sun.ac.za; 021 808 4622] at the Division for Research Development.

**SIGNATURE OF RESEARCH SUBJECT OR LEGAL REPRESENTATIVE**

The information above was described to *[me/the subject/the participant]* by *[name of relevant person]* in *[Afrikaans/English/Xhosa/other]* and *[I am/the subject is/the participant is]* in com-

mand of this language or it was satisfactorily translated to *[me/him/her]*. *[I/the participant/the subject]* was given the opportunity to ask questions and these questions were answered to *[my/his/her]* satisfaction.

*[I hereby consent voluntarily to participate in this study/I hereby consent that the subject/participant may participate in this study.]* I have been given a copy of this form.

---

**Name of Subject/Participant**

---

**Name of Legal Representative (if applicable)**

---

**Signature of Subject/Participant or Legal Representative**

**Date**

|                                  |
|----------------------------------|
| <b>SIGNATURE OF INVESTIGATOR</b> |
|----------------------------------|

I declare that I explained the information given in this document to \_\_\_\_\_ *[name of the subject/participant]* and/or *[his/her]* representative \_\_\_\_\_ *[name of the representative]*. *[He/she]* was encouraged and given ample time to ask me any questions. This

conversation was conducted in [*Afrikaans/\*English/\*Xhosa/\*Other*] and [*no translator was used/this conversation was translated into \_\_\_\_\_ by \_\_\_\_\_*].

A. McKinley

**Signature of Investigator**

**Date**

## Appendix C.

### Employee Well-being Questionnaire

#### Demographic Information

Please fill in the personal information below.

|                              |       |       |        |       |
|------------------------------|-------|-------|--------|-------|
| <b>Gender</b>                | Male  |       | Female |       |
| <b>Age</b>                   | 18-30 | 31-40 | 41-50  | 51-60 |
| <b>Occupation/ Job Title</b> |       |       |        |       |

#### The Satisfaction with Life Scale (SWLS)

Instructions:

Below are five statements that you may agree or disagree with. Using the 1 - 7 scale below, indicate your agreement with each item by placing the appropriate number on the line preceding that item, where 1 = strongly disagree and 7 = strongly agree. Please be open and honest in your responding.

1. In most ways my life is close to my ideal.
2. The conditions of my life are excellent.
3. I am satisfied with my life
4. So far, I have gotten the important things I want in life.
5. If I could live my life over, I would change almost nothing.

**The Positive and Negative Affect Schedule (PANAS)**

Instructions:

This scale consists of several words that describe different feelings and emotions. Read each item and then indicate the extent you have felt this way over the past week by assigning a number from 1 to 5 next to each word, where 1 = very slightly or not at all, and 5 = extremely.

1. Interested
2. Distressed
3. Excited
4. Upset
5. Strong
6. Guilty
7. Scared
8. Hostile
9. Enthusiastic
10. Proud
11. Irritable
12. Alert
13. Ashamed
14. Inspired
15. Nervous
16. Determined
17. Attentive
18. Jittery
19. Active
20. Afraid

## **The Affective Well-being Scale (AWBS)**

Instructions:

In the section below, please indicate how you feel right now, that is, at the present moment. Please assign the most appropriate number on the six-point scale, where 1 = not at all to 6 = very much.

1. Anxious
2. Worried
3. Tense
4. Relaxed
5. Comfortable
6. Calm
7. Depressed
8. Miserable
9. Gloomy
10. Happy
11. Pleased
12. Cheerful
13. Bored
14. Sluggish
15. Dull
16. Enthusiastic
17. Optimistic
18. Motivated
19. Tired
20. Fatigued



21. Sleepy
22. Active
23. Alert
24. Full of energy
25. Angry
26. Annoyed
27. Aggressive
28. Placid
29. Patient
30. At ease

### **The Scales of Psychological Well-Being (SPWB)**

#### Instructions:

Please assign a number to each statement to indicate how much you agree or disagree, using a 7-point scale, where 1 = strongly disagree and 7 = strongly agree.

1. "I am not afraid to voice my opinions, even when they are in opposition to the opinions of most people."
2. "For me, life has been a continuous process of learning, changing, and growth."
3. "In general, I feel I am in charge of the situation in which I live."
4. "People would describe me as a giving person, willing to share my time with others."
5. "I am not interested in activities that will expand my horizons."
6. "I enjoy making plans for the future and working to make them a reality."

7. "Most people see me as loving and affectionate."
8. "In many ways I feel disappointed about my achievements in life."
9. "I live life one day at a time and don't really think about the future."
10. "I tend to worry about what other people think of me."
11. "When I look at the story of my life, I am pleased with how things have turned out."
12. "I have difficulty arranging my life in a way that is satisfying to me."
13. "My decisions are not usually influenced by what everyone else is doing."
14. "I gave up trying to make big improvements or changes in my life a long time ago."
15. "The demands of everyday life often get me down."
16. "I have not experienced many warm and trusting relationships with others."
17. "I think it is important to have new experiences that challenge how you think about yourself and the world."
18. "Maintaining close relationships has been difficult and frustrating for me."
19. "My attitude about myself is probably not as positive as most people feel about themselves."
20. "I have a sense of direction and purpose in life."
21. "I judge myself by what I think is important, not by the values of what others think is important."
22. "In general, I feel confident and positive about myself."
23. "I have been able to build a living environment and a lifestyle for myself that is much to my liking."

24. "I tend to be influenced by people with strong opinions."
25. "I do not enjoy being in new situations that require me to change my old familiar ways of doing things."
26. "I do not fit very well with the people and the community around me."
27. "I know that I can trust my friends, and they know they can trust me."
28. "When I think about it, I haven't really improved much as a person over the years."
29. "Some people wander aimlessly through life, but I am not one of them."
30. "I often feel lonely because I have few close friends with whom to share my concerns."
31. "When I compare myself to friends and acquaintances, it makes me feel good about who I am."
32. "I don't have a good sense of what it is I'm trying to accomplish in life."
33. "I sometimes feel as if I've done all there is to do in life."
34. "I feel like many of the people I know have gotten more out of life than I have."
35. "I have confidence in my opinions, even if they are contrary to the general consensus."
36. "I am quite good at managing the many responsibilities of my daily life."
37. "I have the sense that I have developed a lot as a person over time."
38. "I enjoy personal and mutual conversations with family members and friends."
39. "My daily activities often seem trivial and unimportant to me."
40. "I like most parts of my personality."
41. "It's difficult for me to voice my own opinions on controversial matters."

42. "I often feel overwhelmed by my responsibilities."

### **The Workplace Well-being Index (WWBI)**

#### **Part 1: Work as a Whole**

(Measured by a 0-10 end defined scale, where 0 = completely dissatisfied and 10 = completely satisfied)

1. How satisfied are you with your job as a whole?

#### **Part 2: Domains of Workplace Wellbeing**

(Measured by a 0-10 end defined scale, where 0 = completely dissatisfied and 10 = completely satisfied)

1. How satisfied are you with how much responsibility you have at [company name]?
2. How satisfied are you with how meaningful your work is?
3. How satisfied are you with your independence at [company name]?
4. How satisfied are you that your work allows you to use your abilities and knowledge?
5. How satisfied are you with the sense of achievement your work gives you?
6. How satisfied are you with being valued as a person at [company name]?
7. How satisfied are you with the recognition you receive for good work?
8. How satisfied are you with your level of influence in [company name]? \*
9. How satisfied are you with your pay at [company name]?
10. How satisfied are you with your job security?

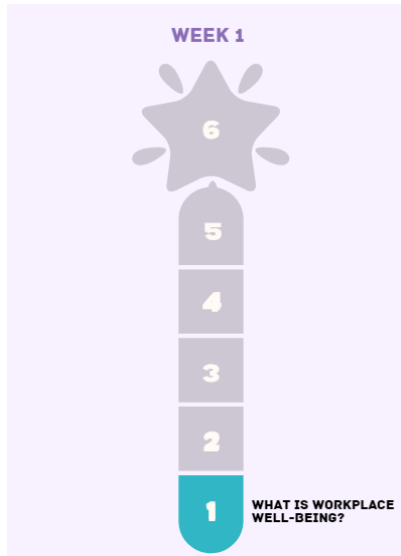
11. How satisfied are you with the convenience of your work hours?
12. How satisfied are you with your working conditions?
13. How satisfied are you with your supervisors at [company name]?
14. How satisfied are you with your co-workers? \*
15. How satisfied are you with your promotional opportunities at [company name]?

## Appendix D.

### Gamified Employee Well-being Meter

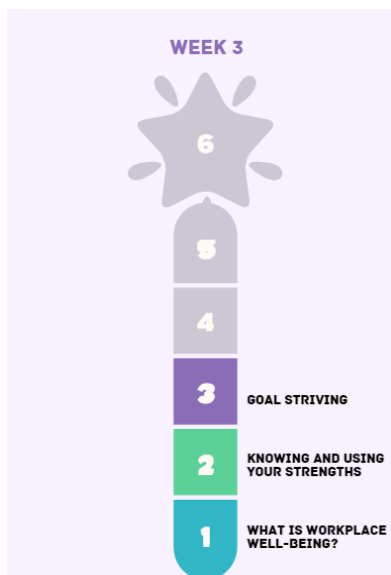
**Figure D. 1**

*Gamified Employee Well-being Meter: Week 1*



**Figure D. 2**

*Gamified Employee Well-being Meter: Week 3*



**Figure D. 3**

*Gamified Employee Well-being Meter: Week 6*

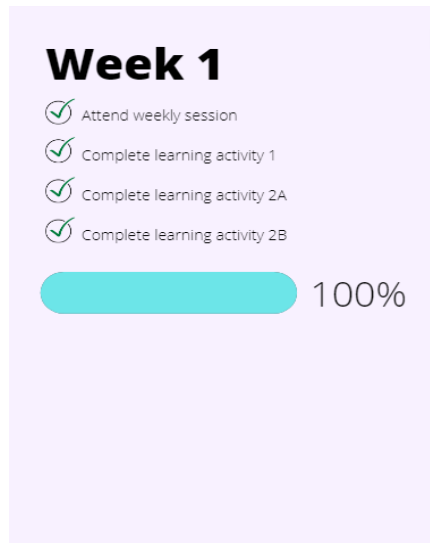


## Appendix E.

### Gamified Individual Progress Report

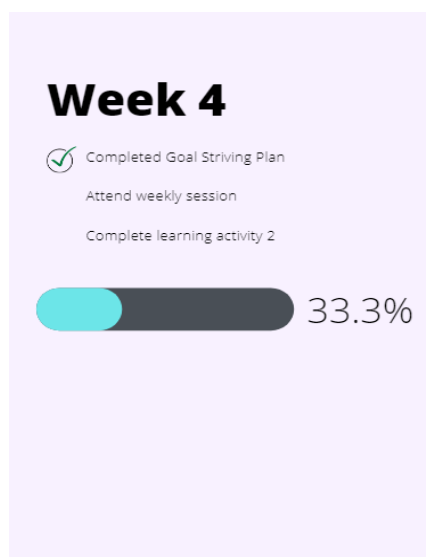
**Figure E. 1**

*Example of Gamified Individual Progress Report: Week 1*



**Figure E. 2**

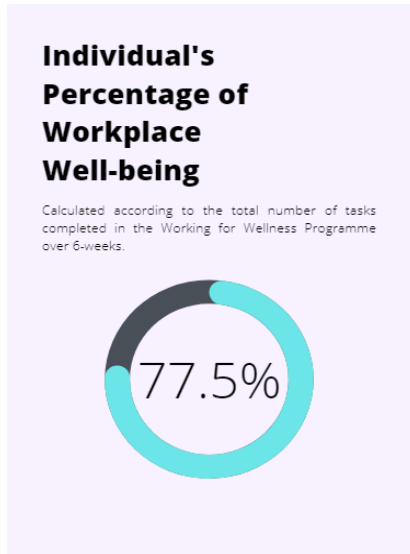
*Example of Gamified Individual Progress Report: Week 4*





### Figure E. 3

*Example of Gamified Individual Progress Report Summary*

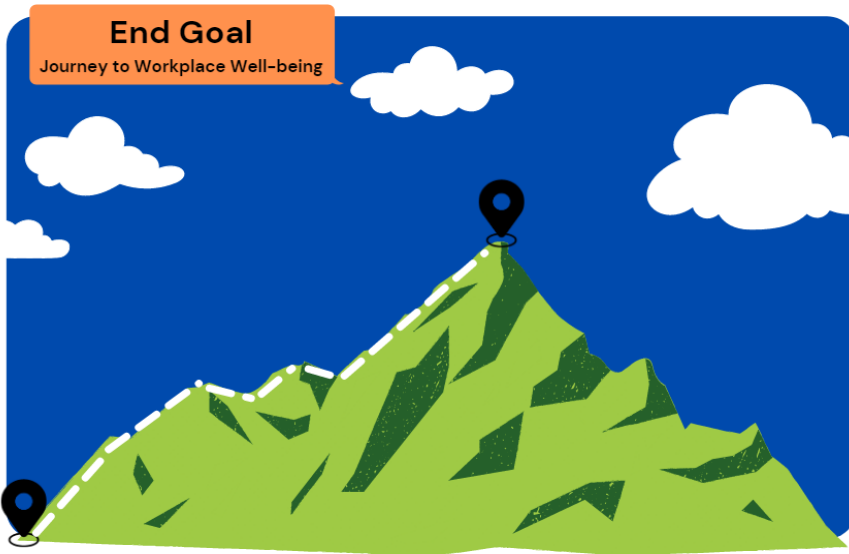


## Appendix F.

### Gamified Group Progress Map

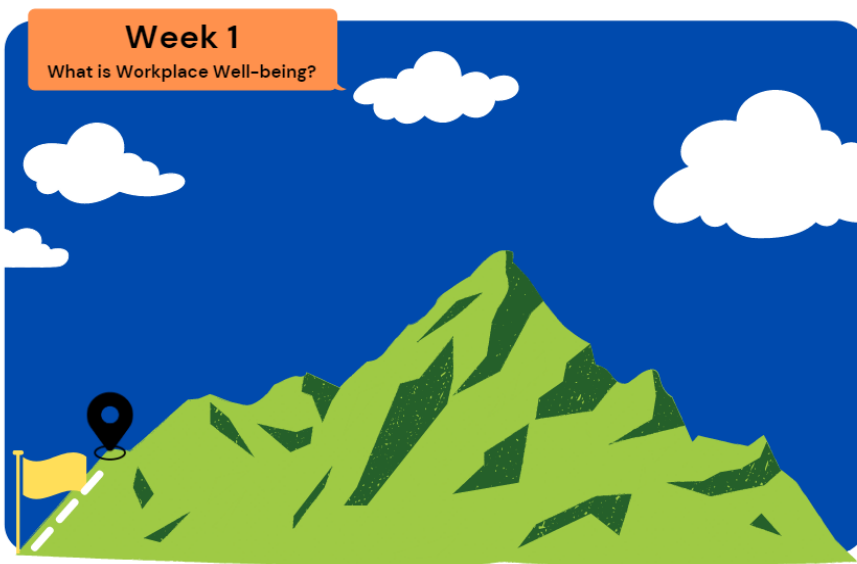
**Figure F. 1**

*Example of Gamified Group Progress Map: End Goal*



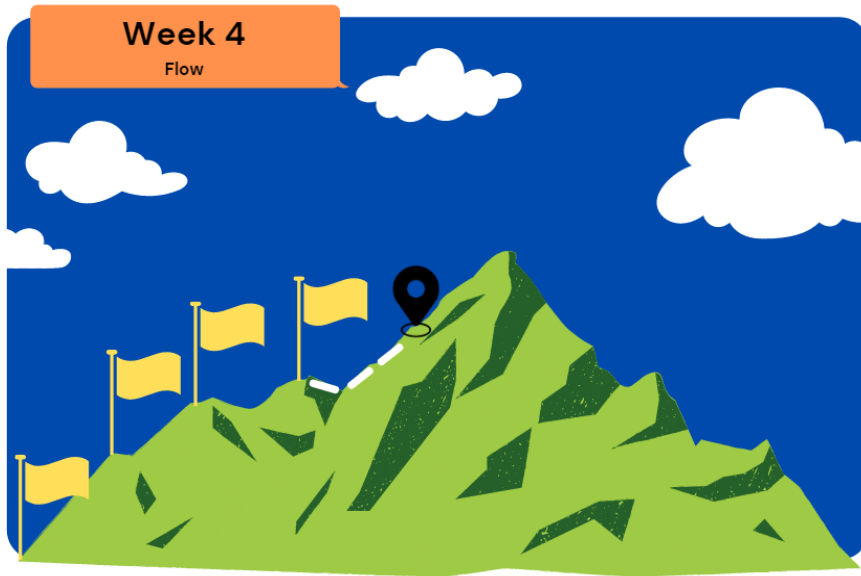
**Figure F. 2**

*Example of Gamified Group Progress Map: Week 1*



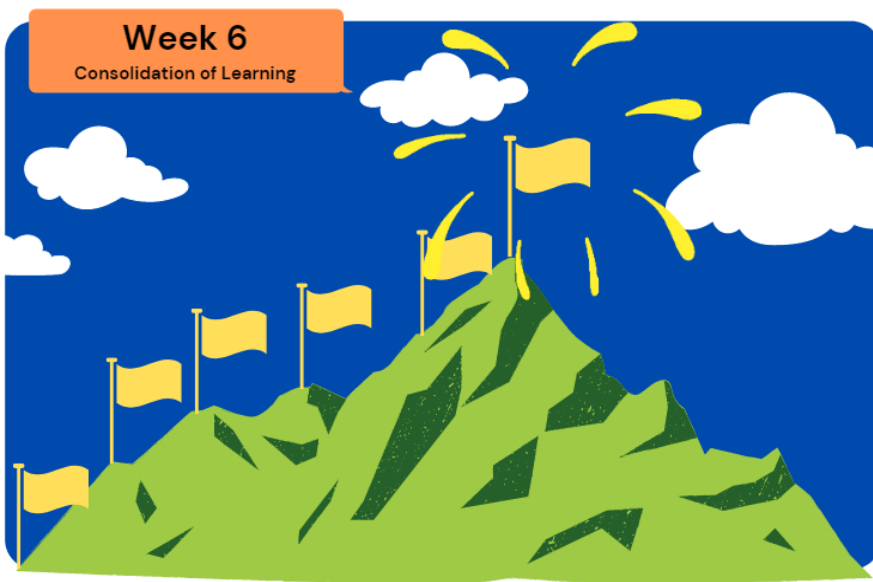
**Figure F. 3**

*Example of Gamified Group Progress Map: Week 4*



**Figure F. 4**

*Example of Gamified Group Progress Map: Week 6*



## Appendix G.

### Virtual Badges

**Figure G. 1**

*Example of a Virtual Badge*

