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Engagement, gamification, and workplace satisfaction: A convergent study of user indicators

Josiah J. Eikelboom MA
University of Southern Maine

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indicators

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Abstract

The purpose of this study was to determine if there was a correlation between the personal indicators of gamification users, game preferences, and workplace engagement. A three-part survey was deployed through an online, opt-in gamification platform in order to gauge individual user preferences. A total of 53 users responded to the survey, which consisted of a demographic questionnaire, the Big Five Inventory (BFI) personality assessment, and a qualitative questionnaire focused toward game style preferences and workplace engagement. Qualitative responses gave weight to data trends and aided in linking gamification preferences to participant indicators. As the data was analyzed, certain trends emerged among the responses. Participants in general proved to be more open to experience yet also more introverted. These two personality factors also linked to preferences in certain game types, such as narrative and cooperative play. Overall, users indicated that gamification aided them in their workdays by keeping them engaged in otherwise unengaging environments, and by heightening their effectiveness, motivation, and efficiency when their workplaces were otherwise engaging. The implications of this is that organizations may be able to utilize targeted gamification builds in order to better engage subsets of employees through preference-driven utilization.

Keywords: gamification, games, engagement, Big Five Inventory

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CHAPTER I

INTRODUCTION

As we move further into the 21st century, video games are becoming more of a
standard of cultural interaction rather than simply just games. According to the
Entertainment Software Association (2015), forty-two percent of the population plays at
least three hours of video games a week. This amounts to a 15-billion-dollar industry
where a mode of fun has begun to transcend the boundaries of simple products and make
their way into the cultural landscape. Games like Angry-Birds (© 2009-2015, Rovia
Entertainment Ltd.) and Candy-Crush (© 2015, King.com Ltd.) have not only become
immense hits in the entertainment world, but pop culture icons as well. Increasingly,
however, games are being used in applications outside of entertainment. This is referred
to as "gamification." Specifically, gamification, a term first coined by Nick Pelling in
2002 (Marczerski, 2012), is the "application of game mechanics in non-game contexts"
(Deterding, Dixon, Khaled, & Nacke, 2011, p. 1). Jane McGonigal (2011) framed game
use in practical settings as a means to engage audiences by inviting users to overcome
obstacles, and obtain rewards. One example, Duolingo, an online language learning site
developed by Luis von Ahn, Ph.D., and Severin Hacker, Ph.D., of Carnegie Mellon
University ("About Duolingo", 2015) offers mechanics such tools as points, levels,
rewards, and progress bar tracking to engage users in learning a new language. Delta
Airlines, Inc., and the communications company Cisco Systems use gamification
platforms to engage their employees and stimulate company growth. Delta's *Ready, Set,
Jet!* © program was able to reduce employee training time from two years to one by

implementing a fun gamification system for their employees to learn in (Buckner, 2014).

But do these systems appeal to all users? Given the varied motivations, psychologies, and

needs of individuals, it is unlikely that one static system would appeal to everyone. What

factors then may add or detract from individuals' enjoyment of games and engagement in

gamification? Can these factors also be correlated to the commitment of the individual

and satisfaction towards their workplace organization?

Building on Deterding et al.'s (2011) assertion that gamification is increasingly

being utilized by institutions, it is important to take a deeper look at user traits; namely,

user personality and demographic factors. Hassenzahl et al. (2013) posit that positivity

and positive experience are associated with psychological fulfillment of need. If a

gamification system can provide positive experiences to those who interact with it, and it

fulfills user psychological needs, those engaged in the system would want to return and

continue playing. For businesses and leaders that utilize gamification, what can be done

with gamified systems to increase employee engagement? Arguably, part of the answer

lies in what individual factors of a user's personality and background make them more or

less inclined to accept, and excel with, gamification.

Purpose Statement

The purpose of this mixed-methods study was to (a) analyze the demographic,

five-factor personality, and subjective indicators of users engaged in opt-in gamification

systems for correlative instances and frequency, and (b) evaluate how these factors may

affect user's feelings of engagement and workplace satisfaction. The research was

structured as a convergent mixed-method model. This involved collecting both

quantitative and qualitative data from the same sampling and using each to explain the

other. This data was collected from users of an online, opt-in gamification system. Both forms of research were gathered in a single, combined instrument in three parts. In the first part, a quantitative survey in the form of a demographic instrument was employed. The second part consisted of a validated five-factor model personality instrument. These two sections gauged the demographic and psychological foundations of the sample group. In the final part, a series of ten qualitative questions were employed to gauge individual impressions of the system, preferences of game mechanics and genres, as well as relative, subjective engagement and feelings of workplace satisfaction. By studying the links, or lack thereof, a more thorough understanding of user/system interaction indicators emerged. The hope is that the findings may aid in pushing gamification to the next level by adding clarity on how gamification systems may be tooled to maximize individual and group user engagement, productivity, and organizational commitment.

Definitions

For this study, several terms are used to identify different styles and applications of gamification. Table 1 shows the terms and definitions that were used throughout this study to frame certain aspects of gamification implementation.

Research Questions

During the course of this study, three research questions were addressed. As a mixed-methods approach was used, a quantitative, a qualitative, and a mixed-methods research question were explored.

1. Do user demographic, psychological, and subjective indicators correlate with usage of gamification platforms?

2. What gamification mechanics and genres are more or less preferred by

   user demographic or personality types?

Table 1

Definitions of Gamification Terms

Term	Definition
Gamification	Using game elements in non-game contexts[a].
Gamification layer	A gamification framework that overlays, and adds to, an existing system framework.
Gamification system	A system that utilizes gamification. Often this is in the form of adding a gamification layer to and existing system framework.
Gamification platform	A gamification system that has been built solely for the purpose of gamification.
Gamify/Gamified	The process of adding gamification to an existing framework.
Mechanic	An individual mechanism or mechanisms within a gamification system.
Genre	The overarching framework of a game that determines the type of interactions available within[b].

a. Deterding, Dixon, Khaled, & Nacke, 2011.

b. Apperley, 2006.

3. How does engagement in gamification relate to feelings of workplace satisfaction and organizational commitment?

Sub-Problem

Where the primary problems explored in this study relate to what individual user attributes (if any) are factors in determining how engaged an internal user will be within a gamified system, other information was also gleaned from the data gathered. In addition to the research questions above, the following sub-problem was explored:

Is there a relationship between user preferences for certain game mechanics and genres and other game mechanics and genres?

Hypotheses

There exist a number of factors that contribute to how users engage in gamification and the benefits they derive from certain elements. As will be seen in the supporting literature, user demographics and personality are two such factors. In studies such as the research done by Koivisto and Hamari (2014), it is shown that demographics such as age and gender do influence how, and with what elements, users engage in gamification. To draw off of this data, the first hypothesis is that demographics influence the fulfillment users derive from gamification –particularly in the form of preference of individual gamification elements.

H1: User demographics affect the level of fulfillment derived from individual gamification elements.

Further, psychological factors also influence engagement in gamification. Engagement, in fact, has roots in personality (Macey & Schneider, 2008). It stands to reason then that personality factors also sway one's level of engagement in a general

sense. A second hypothesis is that personality and demographics are connected in how an individual chooses to engage in gamification and to what level.

H2: There is a direct correlation between user demographic factors; the five-factor traits of openness, conscientiousness, extroversion, agreeableness, and neuroticism (Erdheim, Wang, & Zickar, 2006; McCrae & Costa, 1987; Roccas et al., 2002); and how users engage in gamification.

Delimiters

This study did not look at the subject matter inherent in the gamification system as far as theme, specific functionalities, or ease of use. Instead, the focus was on the level of engagement of the user and the factors that may go into informing their level of participation. Additionally, this study did not look at individual user professions as factors that may or may not have been involved in the adoption of the gamification system and elements. For example, the research did not look specifically at the adoption rates of users in medical care fields as compared with those in education. In addition, voluntary users of opt-in gamification systems were targeted for this study. Those who use gamification in a closed system, such as those that may be required by their workplace, were not evaluated.

Assumptions

For this study, the assumptions were that (a) the users voluntarily participate in gamified content; (b) users come from a variety of backgrounds, age groups, and interest levels; (c) the gamification platform offers various options of elements such as levels, badges/trophies, social engagement, and solo play; and (d) the gamification platform works and is not subject to regular downtime or loss of functionality.

Importance

  Gamification has become more prevalent in recent years as a method for businesses to improve their organizations by engaging employees and customers (Dale, 2014). As such there is a need to analyze the factors that may influence user engagement in gamification so that gamification platforms, and workplace organizations can implement gamification standards to the increased benefit of their users and employees. As a relatively new method of organizational functionality, there is much research to be done.

CHAPTER II

REVIEW OF THE LITERATURE

  This literature review outlines the current research on gamification. In this section the following topics will be discussed: (a) the definition of gamification and mechanisms of gamified systems; (b) engagement and motivational behavior; (c) the five-factor model personality framework; and (d) user demographics and engagement. The current review is limited to discussion of gamification, gamified systems, and socio-behavioral implications of user involvement. This review does not address game theory, serious games, or an overview games played for recreational purposes.

Definition and Mechanisms of Gamification

  Definitions. "Gamification" was first coined by Nick Pelling in 2002 (Kamasheva, Valeev, Yagudin, & Maksimova, 2015). There was not a widely accepted

definition until Deterding et al. (2011) formulated a hypothesis stating that gamification was "the use of game design elements in non-game contexts" (Deterding, Dixon, Khaled, & Nacke, 2011, p. 1). This stands as the most cited definition with prior attempts included for client benefit and problem solving (Deterding et al., 2011), enhancing the service system for value creation (Huotari & Hamari, 2011). Others, such as Nicholson (2012), added elements to further specify the implementation of gamification such as the activity of engaging in gamified systems with point systems and extrinsic rewards for reaching progressive stages. In these definitions, an emphasis on a more technical and system-specific view of gamification is made; the organization-centered approach. Elements, points, value creation, and extrinsic reward are all cited. Certainly it seems the focus in these views is on gamification as a tool used simply as a platform for users to interact with, like a claw game at a carnival - the user manipulates the tool to achieve the goal. In the case of the claw game it is to grab a toy and drop it into the chute. On successfully completing the goal, the user is rewarded with a prize, often the toy itself. Yet how sustaining can this process be? One can imagine that such repetitive and mundane action, while fun at first, can grow wearisome quite quickly, its tedium eventually outstripping the thrill of the reward.

Deterding et al. (2011) further defines gamification as a means to make "non-game products and services more enjoyable and engaging" (p. 2). McGonigal's (2011) view, which sees gamification as filling the gaps in reality, adds a more proactive and utilitarian view. Nicholson (2012) frames his earlier stance on points and extrinsic rewards with a more user-centric approach to gamified systems, resulting in more meaningful interactions. In these scenarios, the users may have system elements tailored

to their particular needs or have actual input into the creation of the systems themselves. This creates a more intimate interaction between the systems and users such that the users may derive more intrinsic meaning from system interaction – a claw game where the user can design part of the process and derive a certain sense of self-satisfaction from seeing their work in action. Where, in user-centered design the needs of the users and user interaction are taken into account, organization-focused design values the bottom line (Nicholson, 2012). After all, the real goal of the claw game is to make its owner money, not the make user happy. As such there is the inherent potential to exploit users by disregarding their needs and welfare in favor of the needs of the organization. This ties in to Bogost's (2011) re-labeling of gamification as "exploitationware" in order to better highlight what he saw as the inherent exploitative nature of gamified systems.

Gamification as a behavioral predictor and marketing tool is another viewpoint. Current studies make the case for using gamification as a means to glean user preferences, patterns, and behavior (Maan, 2013), though the predominant view is on customers and students. A significant opportunity exists in studying the effects on employee users and uses for internal business applications.

Mechanics. The mechanics of gamification are the means by which the systems are interacted with by users, the elements that Deterding (2011) mention in his definition. While the central aspect of gamification is game, it only uses some design elements particular to games, such as badges and trophies, point systems, and leaderboards. Using "game" in the term denotes a certain level of user engagement (Nicholson, 2012), and Deterding (2011) states that even adding or changing the name of something to include "game" fundamentally changes how that thing is seen.

As stated above, gamification includes such mechanics as points systems, badges, levels, rules, feedback, rewards, narrative, and leaderboards in certain combination in order to offer a gamified surface plain (Deterding, 2011; Maan, 2013; Nicholson, 2012). Gamification, however, often is seen to leave play behind in favor of goal setting (Nicholson, 2012). Yet, other observations underscore that the elements of feedback, fun, goals, playfulness, and others could make users more engaged in a gamified task (Maan, 2013) and that users need more than scorekeeping to be engaged and understand their progress within the system (Nicholson, 2012).

In Werbach's pyramid of gamification (Figure 1), three levels comprise the elements of a gamified system: components, mechanisms, and dynamics (Kamasheva et al, 2015). On the bottom are components that are the pieces of the systems, such as badges, leaderboards, and levels. The second tier is mechanisms which are how the system works, scores are tabulated, ect. The tip of the pyramid is dynamics. Dynamics are the social and emotional pieces that are invoked in gamified systems through such components and mechanisms as feedback, rewards, and resource gain (Kamasheva et al., 2015). These elements, when applied to a non-game system can make those systems more engaging and influence user behavior (Mann, 2013; Nicholson, 2012).

"Gamification should be imbued with mechanisms that afford social interaction in order

Figure 1. Werbach's pyramid of gamification

to enhance social influence and perception of reciprocal benefit" (Hamari & Koivisto, 2013, p. 8). This adds the dimension of meaningful gamification for increased user engagement and system satisfaction. Meaningless gamification, which focuses more on the benefit to the organization rather than the user, does not support sustained user engagement (Nicholson, 2012); nor does adding mechanisms without user support or interest. Relying on components such as point systems without a framework for the user to derive meaning from those components creates a hollow and unengaging experience. Accordingly, without meaningful engagement the user experience falls flat (Nicholson, 2012).

Adding meaning, or instilling meaning into a system creates a fuller user experience. Converse to a hollow, meaningless experience, a meaningful, robust experience is more apt to engage individual users. This can be seen in Oh and Sundar's (2015) definition of user engagement as the "psychological state where users are either cognitively or emotionally involved in a task at hand" (p. 215). Adding meaning to a system, aids in garnering this high level of involvement. In the next section, this review

will look at the behavioral implications of gamification and the elements that lend to user engagement and feelings of accomplishment, including the factors of the Five-Factor Model and user motivation.

Engagement and Behavior in Gamified Systems

       Motivational Factors. Motivation is a key factor in user engagement in gamified systems. It drives users to act both internally (within the system) and externally (in the real world) (Nicholson, 2012). Bandura's (1986) social cognitive theory of psychological matching fits with games and gamification scenarios in this respect. Where social cognitive theory looks at the convergence and mutual interplay of social, environmental, and cognitive elements, gamification ideally seeks to integrate the environmental aspect of the game world/platform, the social interaction of fellow users, and cognitive engagement of the individual through direct interaction. Social interaction especially proves to be a powerful change-agent in gamification. Where social communication can be seen as a desired part of gamified systems in order to enhance user self-identification and feelings of motivation and satisfaction (Nicholson, 2012; Hamari and Koivisto, 2013), Doh and Whang (2013) state that users will potentially change their views in response to other users in the acquisition of recognition and rewards. This is due to such closed systems being cultural microcosms, with their own regulating norms and subjective, binding social contracts. Self-identification with goals and groups produces more internalized identifications with the system and sense of meaningful participation (Nicholson, 2012). Such instances of intrinsic motivation create less of a distraction experience and more of a gratification experience (Doh & Whang, 2013).

The importance of self-identification in gamification in regards to engaging employees should not be understated. To bring to bear Kahn's (1990) assessment of employee engagement, it is inherently bound in an individual's desire to assert one's *self* in work roles. This attribute of wanting to assert individual agency as well as group membership leads to an oscillating, push-me, pull-you state of engagement and disengagement from work. Disengagement is inherently separate from the organization and can lead to lead to such actions as sacrificing others for the sake of maintaining individual agency (Kahn, 1990). The ideal is a state of engagement where the individual is not compelled to break away to reassert their sense of self, and in fact will work to maintain the sanctity of the organization and their interpersonal work relationships (Kahn, 1990). Self-identification as outlined by Nicholson (2012) offers assertion of the self through identification with groups and/or goals. Through this, intrinsic motivation is instilled, engaging individuals both on the level of the self and the organizational/group level.

In gamification, important factors that increase intrinsic motivation are recognition, reciprocal benefit, and network exposure (Hamari & Koivisto, 2013), all elements that work into Kahn's concept of employee engagement. Recognition appeals to one's sense of self-assertion, reciprocal benefit aids in asserting the self within the socio-organizational confines of one's workplace, and network exposure ties an individual to the organization at large. Hamari and Koivisto's (2013) research found that these three aspects are interwoven, their trajectories tied together in a mutually beneficial relationship. In their study, they found that an increase in recognition also increased an individual's feeling of reciprocal benefit from the gamification system; this increase in

feeling of reciprocal benefit in turn lead to greater feelings of user satisfaction. Network exposure influences social belonging and feelings of recognition by exposing users to a broader social network. A broader social network increases the user opportunities for reciprocal interaction among peers, increasing the scale of user benefits from those interactions such as encouragement, problem solving, and competition. Such engagement helps establish gamified systems that are intrinsically meaningful and rewarding to the user (Kamesheva, 2015; Nicholson, 2012). Extrinsic motivators can also be introduced, but such motivators have the potential to decrease intrinsic motivation (Deterding, 2011b; Gagne & Deci, 2005; Nicholson, 2012). As intrinsic motivation decreases, so does the relative self-supported meaning for the user; its hold supplanted by an extrinsic action/reward framework. Once the reward/tedium threshold is reached, more rewards must be given in order to maintain the user's engagement. Not so for intrinsic reward, which is generated from the user's sense of self-satisfaction, and thus relatively self-sustaining.

As illustrated in the above examination, intrinsic factors such as recognition, reciprocal benefit, and network exposure have a mutually beneficial relationship -- having more is not necessarily detrimental to user engagement. Too many external control mechanisms on the other hand, can give the feeling of undermining a user's autonomy (Deterding, 2011). This is echoed by Maan (2013) who offered that extrinsic rewards are acceptable if they meet certain needs of the particular user. It is more reliable however, to opt for intrinsic motivating factors such as mastery accomplishment and measurable and reportable successes within a social framework. The degree to which one participates in these engagement practices varies between participants (Doh & Whang,

2014; Hamari & Koivisto, 2013; Koivisto & Hamari, 2014). Given the wide variations between individuals, it stands to reason that individual personality can affect how one approaches, adopts, and embraces interactive stimuli. Macey and Schneider point out that engagement can be seen as an aspect of personality (2008) and thus gauging user personality factors and typologies can aid in determining individual factors in gamification engagement. For the purpose of this study, the Five-Factor Model was used to evaluate the personality traits and trends inherent in user engagement in gamification. Table 2 offers a definition for each of the five factors.

The Five-Factor Model. Individual psychological factors can alter how one is motivated, engaged, and finds meaning. For the purpose of gamification the question is, are there psychological factors that can be attributed to differences in how separate users interact with and are engaged in gamification? The Five-Factor Model (FFM) offers a robust option to quantify individual's personality differences in a meaningful way to attempt to find these differences (Erdheim, Wang, & Zickar, 2006). This model consists of a series of evaluative questions that gauge the subject's relative levels of attribution in five different dimensions rated on a 1-5 scale: (a) openness to experience; (b) conscientiousness; (c) extroversion; (d) agreeableness; and (e) neuroticism (Erdheim et al., 2006; McCrae & Costa, 1987; Roccas, Sangiv, Schwartz, & Knafo, 2002).

McCrae and Costa's (1987) validation study proved that the FFM holds up to individual evaluation, showing correlations across the strata of takers and categories as well as a high reliability coefficient. Specific tests on the Big Five Inventory (BFI) and NEO-Big Five Inventory (NEO-BFI) evaluations showed high test, retest correlations (Gosling, Rentfrow, & Swann, 2003), while Erdheim et al. (2006) found a significant connection between the five factors, organizational engagement, and job satisfaction. Their findings showed that the FFM is a viable structure for how takers are prone to act

Table 2

Definitions and Traits of Big Five Inventory Scales

Scale	Definition[a, b]
Extraversion	How socially-oriented and assertive one tends to be
Agreeableness	How people-pleasing one tends to be
Conscientiousness	How organized, responsible, and careful one tends to be
Neuroticism	How anxious, insecure, and volatile one tends to be
Openness to Experience	How open-minded, sensitive, and imaginative one tends to be

a: Erdheim, J., Wang, M., & Zickar, M. (2006).

b: Roccas, S., Sagiv, L., Schwartz, S., & Knafo, A. (2002).

toward, and be committed to, their respective organizations. This offers high level of relatedness between one's personality and their predilection towards workplace satisfaction and engagement in work-related tasks and achievements (Erdheim et al., 2006).

The idea of relatedness is especially important given the importance of the context in which gamified systems are presented and interacted with. Deterding (2011) states that the context of a gamified system is subjectively interpreted as a social framework. The motivation and involvement that a user has in the system is tied to the social aspects of the mechanisms used (Deterding, 2011). For example, gaining levels and awards may be

weighed against other users, creating direct competition and a social context for engagement.

Despite these findings, not all users become fully engaged in games and gamified systems. While some users may become fully immersed in the system, some may become bored and disengage, dropping out or changing systems altogether. Others may be reluctant to adopt new systems or use gamified components at all. One question that arises is what particular aspects of user backgrounds and personalities factor into how they will receive and interact with gamification elements?

User Demographics and Engagement

In looking at the effect of demographics on user engagement, there appear to be few studies available on the subject. One, Koivisto and Hamari's (2014) study on demographic differences and the perceived benefits of gamification, concerns primarily age, gender, and length of use. Unsurprisingly, younger users were found to be more likely to adopt gamified systems than older generations (Koivisto & Hamari, 2014). This may have to do with perceptions of competency, where the older users are not as familiar with higher tech systems and thus have a lower feeling of self-competence regarding those systems. The same study looked at gender and factors that influenced how men and women derived benefits from gamified systems. Men were found to have a higher perceived benefit from a system when it was found useful whereas women found socially engaging mechanisms more personally engaging (Koivisto & Hamari, 2014). Time was also a factor. Koivisto and Hamari's (2014) study looked at a series of users of different age ranges and genders and how beneficial they perceived the gamified systems. The study showed that comfort and confidence increased with length of time used. This is

partially due to an increased network of social contacts within the system. However, length of time also showed a drop-off in interest, implying that there may be a novelty rate for gamified systems. These rates increase for younger users (Koivisto & Hamari, 2014). The above results show that user demographics have a substantial and real impact on how users interact with gamification elements. In Koivisto and Hamari's research, the demographics of age and sex have definitive correlates with interaction and engagement in gamification. In this instance, age has a negative correlate in relation to time, and sex has a positive correlate for usefulness (male) and sociality (female). These findings imply that a broader scope of demographic indicators may also influence user engagement in gamification. The approach taken in this study was to look at demographics along with subjective self-views of users, personality indicators of the FFM, and how the effects engagement in particular gamification elements.

For the purposes of this study, the Big Five Inventory (BFI) was used to evaluate parameters of user personality (McCrae & Costa, 1987). The BFI involves 44 questions centered on the taker rating how much they self-identify with a given statement on a five-point scale. The results rate the individual on a spectrum of 1-100 for five personality criteria: (a) openness to experience; (b) conscientiousness; (c) extroversion; (d) agreeableness; and (e) neuroticism.

Using this inventory, a dimension of user personalities and preferences was gained in regards to gamification user personality typologies. These typologies helped determine what, if any, aspects may correlate to a heightened predilection towards engagement in gamification and feelings of satisfaction while using it.

Conclusion

In the existing research on gamification there is an emphasis on the need for meaningful interaction with the system. Nicholson (2012), Deterding et al. (2011) and others assert meaningful interactions are the means by which gamification becomes engaging for the users. Self-identification with peer groups and goal structures within gamification creates a framework for these meaningful interactions. Doing so allows users to assert themselves as autonomous individuals within the systems while also adhering to organizational norms. But as autonomous individuals, gamification users also desire to have their personal needs fulfilled. As Hamari and Koivisto (2014) showed, user demographics can play a part in what specific gamification elements are preferred. The conclusions drawn from the existing literature lead to questions of what other factors -- demographic, psychological, and personal -- may influence individual needs within the system as well as what particular elements may be more or less engaging to individuals. In the following sections, the current study explored these questions, drawing on the current literature to inform the analysis and resulting conclusions.

CHAPTER III

METHOD

This study was designed using a convergent mixed-methods model, which gathers both quantitative and qualitative data and integrates the two groups to form a round picture of the problem (Creswell, 2014). Using the convergent design, the qualitative and quantitative data sets will be gathered and analyzed separately, then nitrated for a final combined interpretation. For the purpose of this study, a three-part survey was used to gather the requisite data sets. The first two sections, representing the quantitative

instruments, focused on surveying participants on a series of demographic questions coupled with the Five-Factor Model's Big Five Inventory (BFI). The third section, the qualitative, consisted of a series of open-ended free text questions that aimed to parse the subject's feelings toward gamification and their self-perceived level of engagement in their work roles. The ideal is to use this method to analyze the responses of the participants for correlations between gamification elements, demographic indicators, qualitative themes, and engagement. A mixed convergent method allows these three threads of data to be compiled and woven together, the results displayed in side-by-side analysis. This method extends Koivisto and Hamari's (2014) research in user demographics as indicators of perceived benefit in gamification by applying demographic information along with qualitative impression and psychological typology to measure engagement.

Participants

In this study, the target participant group was individuals who voluntarily engage in gamification platforms to bolster their workplace roles. The sample size was 53 participants from a single opt-in gamification platform. The sampling was random and based on participatory consent. The participant base demographics were varied, but were heavily weighted to certain populations (Appendix A), e.g. female, white, single, and between the ages of 21 and 29. Given the online and open nature of the platform surveyed, participants were international, though the scope of this was not measured in the research.

Measures

Statement of Intent. There was a clear statement of intent posted on the first page of the survey, stating that the survey and its questions were not affiliated with the gamification platform or any other biased party, and that the information gathered would be anonymous and not used for any other purpose but research.

Instruments. The instrument used to measure participant responses was a three-part survey that incorporated demographic, psychological, and qualitative free text sections (outlined below). The instrument was administered via the Survey Monkey survey platform to which users navigated via a link posted on the gamification platform's website. In the gamification system, common areas and guild meeting chats were targeted in order to glean a broad base of user types.

Section 1. (Appendix C). The first section of the instrument involved a demographic survey of ten questions. This instrument surveyed areas such as sex, age, education level, time spent recreationally playing video games, average time spent per week using the gamified system, and preferred game mechanics and genres.

Section 2. (Appendix D). The second section used the Big-Five Inventory. The BFI measures a subject's threshold on the criteria of The Five-Factor model of personality. This instrument measured the user's self-assessed tendencies on the typological scales of openness to experience, conscientiousness, extroversion, agreeableness, and neuroticism in order to gather information on the relative psychological mindset that each participant operates in at the workplace. It is noted that mindsets for the purpose of psychological testing often change with environment. The delivery was thus through the platform itself so as to mitigate subjective external stimuli.

Section 3. (Appendix E). The third section was a series of qualitative questions about participants' usage of the gamification system, their feelings toward it, and their feelings of motivation and job satisfaction. The results of these questions were coded and correlated with the individual's quantitative survey results.

Timeframe. Sections 1-3 above were conducted between January and March 2016.

Relevance. These instruments and methods offer a broad view of user demographics as they pertain to user engagement and personal background. The BFI offers a psychological portrait of the user's that can be related to their gamification engagement and usage as well as their demographic indicators and external inclinations. In this way the hope is to discover correlates between personality, background, employee engagement in gamification, and levels of job satisfaction.

Contribution

The expectation was that the research would show a correlation between user demographic/BFI data, engagement in workplace gamification, and motivation in the workplace. These results have the potential to broaden the research base regarding gamification and user demographics as well as the application of gamified systems in internal business contexts. There is the potential to aid businesses and other organization to tool gamification systems to particular demographic subsets, allowing greater individual engagement and heightened overall motivation and satisfaction.

Analysis

Taking a mixed methods approach to the study, both quantitative and qualitative methods were used to analyze the data. The quantitative data was analyzed using Pearson

correlations along with frequency analytics to determine trends in relationships between the subject group's demographic and BFI indicators, and preferred game elements. The qualitative data was hand-coded following a multi-step process to determine thematic trends. As the qualitative questionnaire revolved around the subject's feelings toward gamification, games, and their workplace, the statements were first evaluated for basic meanings such as engaged, positive experience, negative experience, and motivation. These were then analyzed for further trends among the codes and grouped into major theme structures. From these structures an overall narrative of usage was determined. As this is a convergent mixed methods approach, both sets of data were then combined to form a cohesive and complete picture of the relationships, trends, and preferences of users of opt-in gamification systems.

CHAPTER IV

RESULTS

As stated previously, this study is centered on research questions from each of quantitative, qualitative, and mixed-methods perspectives: (a) Do user demographic, psychological, and subjective indicators correlate with usage of gamification platforms? (b) What gamification mechanics and genres are more or less preferred by user demographic or personality types? and (c) How does engagement in gamification relate to feelings of workplace satisfaction and organizational commitment?

Research Questions One and Two

The first research question (QUAN+QUAL) inquired whether there was a link between participant demographics, psychology, and preferences, and gamification usage. The second (QUAN) explored the concept that gamification mechanics and genres are

more or less preferred by certain user demographic or personality types. For these

questions, the results are segmented into three sections: (1) demographic indicators; (2)

psychological indicators; and (3) qualitative gamification preference.

Demographic indicators. For all demographic factors, frequencies were

Table 3

*Primary Demographic Indicators of Gamification Users (*N = 53*)*

Indicator	n	%
Gender		
Female	39	74
Relationship status		
Single	35	66
Race		
White	40	76
Highest education level completed		
Bachelor degree or higher	35	66
Have children under 18		
No	49	93
Age at time of survey (years)		
21-29	30	57
Recreational gameplay (hours/week)		
1 to 3 hours	20	38

Note. There were no significant frequency trends for level of household income.

determined in order to find any strong trends in participants that may point towards

notable indicators of gamification adoption. The full scope of demographic frequency

data is captured in Appendix A, but for this section, a more selective list is presented

(Table 3). The analysis of the demographic data suggests that the responses skewed

toward certain demographic traits with the highest frequency of responses showing that

participants were predominantly female, white, single, between the ages of 21 and 29,

with no children, and held a bachelor's or higher degree. (It is important to note that these

frequencies are exclusive of one another. The results do not represent a full demographic

picture of a singular, core user, only trends in the overall user base.) Time spent playing games recreationally showed to settle to the relatively low timeframe of one to three hours a week. The more telling aspect of gameplay is that, in total, 81% (*n*=43) of participants engaged in some form of recreational game play in the last seven days. Income did not prove to have any standout results.

Table 4

Intercorrelations for Preferences of Gamification User Demographics for Game Mechanics and Genres

Demographic	Genre			Mechanic		
	Role Playing	Adventure	FPS	Puzzle	Repetitive	Crafting
Gender	.22	.40**	.44**	.14	-.05	.30*
Relationship status	.05	.20	.10	.31*	-.11	-.23
Education level	.14	-.11	-.32*	-.13	-.03	-.12
Children under 18	-.07	.16	-.36**	.25	-.32*	-.31*
Age	-.17	-.31*	-.02	-.16	.21	.10
Recreational play	.31*	.11	-.02	-.10	.15	.06

** Correlation is significant at the 0.01 level (2-tailed).
 * Correlation is significant at the 0.05 level (2-tailed).

In addition to the frequencies of use, Pearson correlations were run between the demographic data points and game genres and mechanics (Table 4). Surprisingly, only a few strong correlations were found. Users who had children under 18, and gender strongly correlated with those who liked first-person shooters (FPS). Gender also highly correlated with enjoying Adventure games. Looking at the breakdown of responses, both FPS and Adventure games correlated with a higher frequency of male and transgender preference. These variables also held some weaker correlations. FPS was also slightly negatively correlated with education level, while the presence of younger children

correlated slightly with enjoying both Repetitive and Crafting game mechanics. Other links show that men slightly prefer Crafting, those who are single slightly prefer Puzzle games, those who spend more time playing games are more likely to engage in Role Playing (RP), and younger players tend to prefer Adventure games.

These tendencies were further investigated by examining the trends in frequency data for the individual demographic factors. As a result, some interesting information was gleaned. Men tended to prefer RP games (90%), however, 100% of participants who indicated they played 10 or more hours of video games a week reported enjoying RP games. This suggests that men tend to play more video games on average. In fact, the data shows that men are twice as likely to play 3-5 hours of games a week, and six times more likely to play 10 or more hours a week. Generally, RP and other game types fall within the hardcore game category. Hardcore games tend to require more of a time commitment and intensified goal attainment (Kirman & Lawson, 2009) than do others such as Casual, Board & Card, and Puzzle games - all genres that are more equal in preference between men and women. In fact, time seemed to be a significant factor in user preference. One such category is participants with children under 18. Assuming that those who indicated yes on this question have less time on their hands to commit to game play as they have dedicated families to care for, it was found that 100% of participants with children enjoyed solo play. Not surprising perhaps given the constant engagement that tends to happen with child care, especially for users low on the Extroversion scale. Further, those with children also enjoyed Co-op (75%), Repetition (75%), Crafting (100%) and Quick games (75%). Conversely, they liked games with narrative less,

presumably because, as stated above, narrative games such as role playing require more time involvement that is not available to those with more responsibility.

With age, other trends emerged. Younger users tend to enjoy PvP more than older users, and disliked cooperating with others. Interestingly the frequency of involvement in cooperative play rises sharply at age 21 (46%) from those participants aged 18 to 20 (14%). Additionally, older players enjoyed Quick games more, while younger players preferred more time-intensive genres like RP games. In total we start to gather a picture of user preferences and how they relate to gamification usage.

Perhaps the most telling demographic indicator was recreational game play. Of all participants, 81 percent reported playing at least one hour of games recreationally in the last seven days. Of these, the majority (38%) played one to three hours a week. In looking at the differences in those who reported not playing games at all compared to those that do, the data offered some interesting revelations. Of those that did not play games (19%), there was a slight positive trend in Solo play, but negative trends in Competition, PvP, and Crafting. These negative trends relate to more towards hardcore games such as massively multiplayer online role-playing games (MMORPGs), Strategy and other modes of gaming that require an intense involvement of player time for the sake of high-scale achievement (Kirman & Lawson, 2009), often against other players. This suggests that those who do not desire to play games outside of gamification are looking for more casual, quick, useful, and socially engaging options.

Of those who did play games recreationally, there were positive trends in Social, Solo, Repetitive, and Narrative. Social and Repetitive showed the strongest preference rate in those users who played seven to nine hours of games a week and Narrative was

100% preferred by those who played ten or more hours a week. This speaks to the more

engaging aspects of social and narrative play, where players are more willing to spend

longer hours engaging with these mechanics. Repetition has interesting interplays with

Extraversion and game play. As we will those lower on the Extraversion scale may be

more likely to engage in indirect social engagement and repetitive tasks, for longer, than

those higher on the scale.

Personality indicators. For participant personality, the means and standard

deviations of the Big Five Personality factors were examined. As Table 5 shows, a fairly

median rating was found between participant's scores. Conscientiousness, Neuroticism,

and Agreeableness did not indicate any telling results. For each of these scale scores, the

minimum and maximum scores existed in the same median realm. The standard

deviations as well laid within a standard range, indicating that a fair range of responses

encompassed the results and that there were no implications in their correlation with

gamification use. The Extroversion Scale Score had a larger range of responses but given

the mean and standard deviation ($M = 2.38$, $S = .71$) it suggests the upper level score

exists more as an outlier than representative of the sample. This suggests that users who

are more introverted (low on the Extraversion scale) may be more inclined to engage in

opt in gamification. This may be influenced by the online nature of the gamification

platform used. With introversion, those who are lower on the Extraversion scale may not

seek direct social interaction (McCrae & Costa, 1987). As a result, online platforms

where social interaction is mitigated by voluntary anonymity may be more desirable.

The BFI Openness Scale score rated the highest ($M = 3.93$; $SD = .59$) constant

among gamification users. This result is given further credence by the minimum and

maximum responses which both rated higher than the other four BFI scales. This indicates that those who engage in gamification are more likely to be more open to new experiences and less risk averse than those who do not approach gamification as a possibility. Examining the high Openness to Experience and median Neuroticism shown in the research, gamification is not for the faint of heart.

Table 5

Means and Standard Deviations of Big Five Inventory Personality Scores (n = 53)

	Minimum	Maximum	Mean	Std. Deviation
BFI Extraversion scale score	1.63	4.75	2.83	.71
BFI Agreeableness scale score	1.56	4.78	3.65	.67
BFI Conscientiousness scale score	1.67	4.56	3.20	.77
BFI Neuroticism scale score	1.25	4.50	3.29	.74
BFI Openness scale score	2.30	4.80	3.93	.59

Game genre and mechanic preference similarly had fairly narrow results. Exploring the relationship between the BFI scale scores and game genre and mechanic preferences revealed only one strong correlation and a handful of weak correlations. Analyzing the results on the Pearson scale it was found that Openness to Experience was positively correlated to adventure games $r(51) = .39$, $p < .001$. Further, Openness correlated slightly to role playing games $r(51) = .34$, $p < .005$, PvP $r(51) = .32$, $p < .005$, and enjoying obtaining Badges and Trophies $r(51) = .34$, $p < .001$. In addition to these indicators, cooperative play (Co-op) was shown to be a multifold mechanic, correlating positively with extraversion, $r(51) = .28$, $p < .005$ and Agreeableness $r(51) = .34$, $p < .001$, and negatively with Neuroticism $r(51) = -.28$, $p < .005$. As cooperative play involves working with others to achieve a common goal, it stands to reason that those higher on Extraversion and Agreeableness would be more inclined to participate. The slight negative influence of Neuroticism speaks to a general heightened sense of social

anxiety in users, such that they may avoid involvement with cooperative gameplay due to its inherently social nature.

Neuroticism in the context of mechanics, showed similar trends as those shown with relation to cooperative play. The higher responses to Neuroticism, those within the top twenty-fifth percentile, had a 0% preference rate for PvP play. This suggests that the inherent interpersonal conflict of player versus player games may not appeal to neurotic players. Similarly, high Conscientiousness scores showed a negative trend with Competition and low Agreeableness scores had a 100% preference rate for Solo play. Interestingly Extraversion did not trend with any of the social game mechanics except PvP. Those participants who scored within the top 25th percentile of Extraversion actually had a 0% preference rate for PvP play. Those higher in Extraversion also had slightly negative reactions to Repetitive games, Crafting, and Narrative. Looking further into Neuroticism response patterns, what was found was a string of negative trends in the more hardcore areas of gameplay. In the higher scoring user responses for Neuroticism, Adventure, Strategy, and Building/Resource Management were less likely to be chosen as preferred styles. In contrast, Casual style games evened out in usage. This data suggests that those who are neurotic are more prone to anxiety from skill-based games and those mechanics that require more of a commitment of time and mental energy to play effectively. Those games that are less hardcore are apt to cause less struggle for neurotic users. Subjectively, those with higher Neuroticism scores tended to find social engagement to be a struggle as well. Looking at the personality and demographic indicators and their correlations and trends within the data, an interesting profile of gamification users has emerged. The quantitative information is only one part, however.

The next section addresses the participant qualitative responses to the survey. These responses give the above data a depth and context, rounding out the overall picture of user/gamification interaction.

       Qualitative gamification preferences. The qualitative portion of the survey (Appendix D) focused on user engagement in their workplace roles and feelings toward gamification and game mechanics. The questions ranged from inquiring how engaged participants felt in their workplace, to how they felt using gamification, to their thoughts on individual gamification mechanics. What emerged was a theme of heightened engagement and efficacy in user work roles with using gamification. Users saw gamification as largely motivating and helped them "be more efficient" and "accomplished" in their workplace roles. The larger theme that emerged was using gamification to assert and further one's *self* within the workplace. Participants stated that gamification offered them "an extra pat on the back", increased their personal enjoyment of their work, helped them feel motivated, productive, focused, and efficient in their tasks and helped give structure to their day. In some cases, stress reduction and productivity were cited as major factors. Taking these aspects together, they circle back to Kahn's (1990) suggestion that engagement is the assertion of the self within a system. The analysis above suggests gamification aids users in asserting themselves in the workplace by adding to their personal and professional efficacy, making them more effective employees and giving them an added sense of intrinsic accomplishment. This idea is further explored below as the participant responses to individual mechanics preferences are taken into account.

For the overall use of game mechanics, users responded with similar notions as those expressed above. Feelings of achievement and motivation were high on users lists, primarily centered on the user's own desires for advancement and self-improvement. Among the responses for motivation and achievement, there were mentions of users engaging in gamification to "find meaning", engage in "mental testing", proving one's self, and self-pacing. The larger theme that emerged was autonomy as a primary motivator for individuals who use gamification. Users desire control in order to gain the benefits they believe they need to be successful. While this seems a largely individual notion, and gamification tends to largely be an isolated or solo endeavor, the qualitative results also showed social interaction to be an important factor.

Social motivation emerged as one of the top four themes for what users enjoyed about gamification. Those who enjoyed social aspects liked collaboration and interaction with others and saw helping others as a way to prove themselves and feel like they were "part of something". This is interesting in comparison to the qualitative survey results of user preference for Social and Co-op mechanics. Neither indicator was especially strong each only receiving around a 50% preference rate. Yet, the prevalence of comments in the general gamification question, belies this. Similarly, negative social comments were also recorded, though only in the responses for Solo mechanic play. Those who preferred solo play preferred the flexibility offered by not involving others. Interestingly, users also expressed anxiety that they would be disappointed in others, or that they would let other's down. This seems to point to an overall desire for flexibility of options to accommodate individual preferences and desires -- those who do not enjoy cooperative or social play

will not feel particularly motivated or engaged in a gamification system centered on these mechanics.

Some gamification mechanics that were reported as the most preferred were Narrative (70%), and Badges/Trophies (66%). Each of these mechanics fit a particular niche in the interaction of users in the gamification system. Badges/Trophies fit within the earlier theme of accomplishment and motivation. The reward that is gained gives users a "sense of achievement" and motivates them to perform tasks and gain the reward. The nature of these being largely intangible and a self-regulated gain prevents them from falling into the extrinsic reward category. The gaining of badges and trophies aids more in giving the users a sense of personal accomplishment, causing them to hunt for particular badge in order to achieve. As they are primarily symbolic representations, this combined with the motivation for users to complete tasks to gain the reward, makes the accumulation of badges and trophies to be mainly a mode of intrinsic reward and thus engagement. Narrative fills an entirely different, though no less engaging niche. Narrative stands a bit unique in the game mechanic category. Where the other mechanics focus on interaction through specific mechanisms and systems such as timing, social interaction, and crafting, narrative creates interaction through creative engagement and emotional involvement. Of those who responded to narrative as a preference terms such as "connection", "engaging", and "getting lost in the game world". These responses fed a theme of creative engagement and emotional involvement for the users. Depth of the narrative was mentioned several times as necessary to this involvement, where a shallow story is not as engaging. Similarly, narratives that are too complex can also cause the user to disengage. The aim then to utilize narrative effectively is to formulate a story with

emotional depth yet technical simplicity in order to engage the largest number of users. This can aid in creating an immersive gamification environment that users can simultaneously "get lost in", and work efficiently.

Research Question Three

The third research question (QUAL) asked how using gamification relates to the user's intrinsic feelings of workplace satisfaction and organizational commitment. For this the focus was on the user responses to the qualitative portion of the survey. The survey questions asked the participant's feelings toward their workplace, where they saw themselves in the future, if they were engaged, and what they liked and disliked about the gamification system they were using. While the results added a depth of scope to the quantitative results, this qualitative proved extremely useful in its own right. For the initial inquiry into the participant's engagement levels, data transformation was used to convert the qualitative responses into quantitative numbers. Of the total participants ($n = 53$), more than half ($n = 32$) chose to respond to the initial question. Taking the quantitative values established by the data transformation, the gathered responses on engagement weighed heavily toward engaged, with more than half (59%) stating that they were engaged in their place of work. The remainder of responses was split between those that stated they were not engaged (19%), and those that gave neutral or non-specific answers (22%).

Once the levels of engagement were established, the next step was to gauge the user thought processes in thinking toward future expectations. The aim was to establish a significant narrative of workplace mindsets before bringing gamification into the mix. The trends that emerged fell into two broad categories: dynamic and security-seeking.

Dynamic participants indicated a desire for such ideals as advancement, opportunity, and flexibility – often in moving vertically in their current place of work or in finding those dynamic mechanics somewhere else. Security-seeking participants were focused more on hopes of perpetuating their current roles and establishing themselves in a solid work routine. These responses skewed more towards passive feelings of hope for the future and maintaining the present, while those who leaned more toward Dynamic, expressed more active intent to advance for their own sake.

These trends establish a distinctive vision of the sample in terms of self-improvement. Those who are more dynamic-minded see their own advancement as an important factor in their workplace relationship. These participants used more secure language in their responses, stating *I will* often, and making confident statements about their next steps. Those who were more on the security-seeking side used words such as *hope to*, *maybe*, and *if possible*. This speaks to a general lack of agency and self-identification. The core goal is maintenance rather than advancement.

Once the responses were codes for trends in dynamic and security-seeking verbiage, and the differences were catalogued, the next step was to look at how these trends lined up with the engagement results stated above. What was found was that the unengaged and neutral participants fell more often into the security-seeking category while the engaged participants were more likely to give dynamic responses. The conclusion that can be drawn from this is that engaged individuals feel more self-identification with the organization, increased agency and an overall sense of confidence in their workplace roles. Those who are not engaged spend more energy attempting to maintain in their positions. The danger here is to jump to the conclusion that engaged

employees are self-actualized and confident and thus more likely to jump ship, or that those who are not engaged will maintain their roles indefinitely out of sheer crushing defeat. The data tells a different story. Looking at the responses of the engaged, dynamic participants, there is more emphasis on internal advancement than external. Unengaged participants were generally non-committal. This suggests that engaged workers are more likely to stay in an organization if there is provided ample opportunity for both personal and professional growth. In some instances, such as the participant who stated that they would be in "the same chair I'm sitting in now unless it breaks", there is little reason to leave at all. These employees may be more resistant to outside temptations that may draw them away if given the opportunity as the intrinsic rewards for staying outstrip the extrinsic rewards of leaving. Given the non-committal answers and general desire for security for unengaged participants, the emphasis there lies more on extrinsic rewards in the form of financial and personal stability and security. As stated previously, extrinsic rewards tend to have a tenuous hold on individuals, requiring steady increases in rewards over time in order to keep users engaged. The qualitative data suggests that employees who are engaged or motivated solely based on an extrinsic, security-seeking connection may be more likely to be drawn away from an organization if an outside source can offer greater extrinsic rewards.

With the engaged/non-engaged and dynamic/security-seeking trends identified above the research was able to frame the subjective experiences of users within their workplace environments. That being established, the next step was to examine how gamification ties into these themes and how it relates to engagement at work and organizational commitment. For the gamification portion of the qualitative survey,

participants were asked how they felt about using gamification at work, what they liked about it, and what they did not. In breaking down the themes within these questions there were interesting correlations to the previous dynamic/security-seeking trends. Subject responses to how they felt about gamification fell into three core categories: accomplishment, effectiveness, and motivation. Feelings of accomplishment were fairly straightforward, with participants stating that they liked having the extra pat on the back, and that it helped alleviate the reward void of longer-term projects. Effectiveness corresponds to feelings toward the participants approach to their work and interaction with their environment. Overall there were heightened feelings of productivity, structure, focus, and efficiency that allowed users to be better at their jobs. Motivation was a more complex user response. Where accomplishment relates to personal and emotional feelings of success, and effectiveness relates to practical interaction with work environments, motivation encompasses practical, emotional, and personal responses. Much of the narrative for motivation fell within the borders of self-improvement. While there were statements of the gamification system motivating users to accomplish their tasks, largely the sentiment was that gamification motivated them to become better workers through the ability to be able to self-focus. One of the more telling responses about gamification's influence was that it inspired the participant "to be a more efficient person and get more work done".

Self-improvement appears as one of the core influences in users reporting their feelings toward gamification. Users who were engaged at work were more likely to state they used gamification as a tool toward self-improvement and self-identification, while those who were not engaged were more likely to use it more as an effectiveness tool.

Despite these findings there was no indication that workplace engagement was linked to feelings toward gamification. Both engaged and unengaged participants similarly reported that they enjoyed using gamification, implying that the engagement on its own is not correlative to gamification's influence. What is indicated is that gamification is a tool that allows users to augment their own capabilities and feelings of engagement. Those who are engaged may be more likely to use gamification to better their position in the organization, be more effective, and round out their own skills, while those who are not engaged may use gamification more as a method of offsetting feelings of organizational disengagement.

Overall, gamification offers users the ability to better engage with their workplace or organization. While there are distinct differences between engaged and unengaged worker responses, there was no real indication that those states affected user perceptions of gamification. What it did seem to change was the focus of intent for participants. Engaged users were more likely to see the gamification system as a means to improve themselves and add an extra element of fun and personal agency with respect to their organization. Those who were not engaged were more likely to use gamification to offset workplace frustrations and to use the systems as more of a tool than a means of personal improvement. Regardless, both sides appeared to appreciate their involvement with the gamification platform.

Sub Problem

In addition to the above research questions, the following sub question was asked: Is there a relationship between user preferences for certain game mechanics and genres? Given the nature of the research, there was the opportunity to look at the different game

mechanics and genres presented and how they related to one another. Specifically Pearson correlations were made between each of the mechanic/mechanic, genre/genre, and mechanic/genre pairs in order to find any significant trends in user preferences.

The first category analyzed was the interrelation between the individual game mechanics (Table 6.1). The results showed that there were strong correlations between two mechanic pairs and several slight correlations among others. The Social mechanic showed the only strong relations, correlating with both the PvP and Co-op mechanics. This is unsurprising as PvP and Co-op are inherently social modes of play. Player versus player requires one to engage with others for the sake of mutual competition, while cooperative play requires one to engage with others for the sake of achieving shared goals. What is interesting is that the Social mechanic did not negatively correlate with Solo play. Qualitatively, the users offered interesting responses to the question of social engagement.

While the majority of users preferred social aspects, not all did. In addition some users preferred cooperative play while others did not. More than one of the responses in the Solo play category cited a layered fear of disappointment. On one side, users stated that they shy away from social/cooperative play because they fear they will hold others back or that they have anxiety dealing with others. On the other, users also stated that they play solo because they don't have to rely on others to accomplish their goals. There emerges a two-sided fear of disappointment among those who prefer Solo play, those who fear disappointing others, and those who fear being disappointed. That there wasn't a negative correlation between Solo and Social suggests that these feelings may be more of a fringe notion than a trend and that users most likely freely switch between the two

modes depending on individual mood, need, and trust level. In analyzing the correlations

between game mechanics and genres (Table 6.2), there were no significant correlations

within the Social mechanics, and only a slight correlation of Co-op play with the Casual

game genre. Solo play however, had string correlations with both Adventure games and

first person shooters (FPS).

The correlations between Solo, Adventure, and FPS could stem from the nature of

the game genre's themselves. While FPS exists in both solo and social modes, the social

mode is often PvP. As a competitive style there is a social aspect, yet FPS is often an

every-man-for-himself scenario that could appeal to Solo preference players. Adventure

games are most often single player games that do not involve much social interaction,

and are thus Solo base on their nature. Similarly, FPS also strongly correlated with PvP

play. As stated, FPS, when social, is most often a PvP scenario.

Table 6.1

Intercorrelations for Preferences Between Game Mechanics for Gamification Users

	Comp	Social	Solo	PvP	Co-op	Repetitive	Crafting	Quick
Competitive	1	.23	.07	.35*	.09	.17	.23	-.01
Social	.23	1	.10	.38**	.40**	.16	.13	.06
Solo	.07	.10	1	.26	.16	.30*	.19	.17
PvP	.35*	.38**	.26	1	.22	.02	.32*	.12
Co-op	.09	.40**	.16	.22	1	.17	.35*	.31*
Repetitive	.17	.16	.30*	.02	.17	1	.14	.09
Crafting	.23	.13	.19	.32*	.35*	.14	1	.03
Badges	.04	.01	.22	.04	-.02	.07	.17	.02
Quick	-.01	.06	.17	.12	.31*	.09	.03	1
Narrative	-.11	.18	.19	.14	.16	-.17	.10	.09

Note: There were no significant correlations for the Badges or Narrative mechanics.
**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).

In addition to the above mentioned mechanic/genre pairs, Crafting showed several

strong correlations. Again, similar to FPS and Adventure, this may be due to the

mechanics being core aspects of the particular genres. Role playing (RP), Building, and

Strategy games all strongly correlated with the Crafting mechanic. Crafting involves the

gathering of resources within the game and processing them into final game artifacts.

These could take the form of game items, buildings, characters, spells, or other in-game

aspects. RP, Building, and Strategy often have this mechanic as an aspect of their genre.

RP games such as World of Warcraft (©Blizzard Entertainment) incorporate mechanics

to allow players to gather resources and fashion them into specific items usable within the

game. Building games by their nature are crafting games as players actively gather

resources in order to build cities, nations, families and the like. Strategy games,

Table 6.2

Intercorrelations for Preferences of Game Mechanics and Genres for Gamification Users

Mechanic	Genre							
	Role Playing	Adv	Building	FPS	Strategy	Casual	Board & Card	Puzzle
Solo	.28*	.37**	.13	.36**	.08	.15	.05	-.01
PvP	.18	.26	.19	.46**	.33*	.18	.24	-.00
Co-op	.26	.07	.16	.07	.23	.28*	.11	-.08
Repetitive	.00	-.12	.03	.29*	-.09	.01	.02	-.09
Crafting	.36**	.25	.43**	.32*	.58**	.17	.08	-.03
Badges	.30*	.28*	.12	.10	.15	.15	.04	.31*
Quick	.14	.16	.07	.20	.08	.25	.35**	-.00

| Narrative | .45** | .37** | .21 | -.04 | .16 | .40** | .05 | -.01 |

Note. There were no significant correlations within the Competitive or Social mechanics.
**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).

especially real-time strategy (RTS) incorporate crafting into their mechanisms as a way to expand buildings, troops, and other in-game offerings. Of the remaining strong correlations, the majority also fall into this pattern of the correlated mechanic being inherent of the genre. When the intercorrelations between the individual game genres (Table 6.3) are examined, the same pattern is seen. In looking back at the discussion concerning Strategy, Building, and RP, similar links can be seen. Building correlates with RP and Strategy, which makes sense given the resource management and crafting mechanics that are often part of those genres. Similarly, Narrative also strongly correlates with RP and Adventure games, which they themselves correlate. However, there is one correlated pair that stands out: Casual games and Narrative.

When talking about Narrative in games, role playing is often cited as the norm for narrative game play. RP games are formed around a central narrative in order to drive the feelings of immersion of the players and is often as integral to the game's framework as the mechanical aspects. To a lesser extent Adventure games do this as well, often incorporating narrative to add emotional cohesion to the mechanical framework. In both of these instances, the genres are often more involved and involving, requiring extended time commitment of the player and thus falling more into the realm of hardcore games. Casual games however, are the opposite. By their nature Casual games are constructed for limited, low-touch engagement and inherently lack the demands that hardcore games ask of their players. As such, there isn't the same length of engagement in Casual games to build the strong, cohesive narrative normally seen in RP and Adventure games. Yet

Casual players show a strong preference for Narrative. We can glean more clarity on this by looking back at the qualitative responses to Narrative already discussed. As determined from the commentary on Narrative, the user ideal seems to be an emotionally deep and technically simple Narrative to achieve maximum engagement. This method could tie into Casual games by adding a relatively simple narrative engagement framework that slowly builds emotional layers through quick and straightforward interactions as the users play. This insight offers a useful possibility into improving the casual engagement aspects of gamification by adding more narrative layers to the mechanical system frameworks.

Table 6.3

Intercorrelations for Preferences of Game Genres for Gamification Users

Genre	Role Playing	Adv	Building	FPS	Strategy	Casual	Board & Card
Role Playing	1	$.48^{**}$	$.39^{**}$	$.31^{*}$	$.33^{*}$	.18	.15
Adventure	$.48^{**}$	1	.06	$.33^{*}$	.21	.10	.03
Building	$.39^{**}$	.06	1	.03	$.47^{**}$	.21	-.11
FPS	$.31^{*}$	$.33^{*}$	.03	1	.16	.19	$.28^{*}$
Strategy	$.34^{*}$	.22	$.47^{**}$	.16	1	$.28^{*}$	.19
Casual	.18	.10	.21	.19	$.28^{*}$	1	.17
Board & Card	.15	.03	-.11	$.28^{*}$	.19	.17	1

Note. There were no significant correlations within the Puzzle genre.
**Correlation is significant at the 0.01 level (2-tailed).
*Correlation is significant at the 0.05 level (2-tailed).

CHAPTER V

DISCUSSION AND CONCLUSION

To summarize, some demographic and psychological indicators show a strong connection to engagement in opt-in gamification systems. While demographic indicators showed correlations with preference for certain gamification mechanics, recreational play of video games was the biggest indicator. This underlines the perhaps obvious notion that people who play games and enjoy them normally are more likely to enjoy, and actively adopt, gamification systems. A less obvious but more telling finding was that those who do not normally play games are less likely to adopt systems that utilize Competitive or Crafting mechanics, suggesting that users may avoid standard game experiences due to an aversion for competition and a paucity of time. Psychologically, there is a strong correlation with gamification users being marginally below the median on the Extroversion scale (i.e. slightly Introverted), and markedly higher on the Openness scale. Given the strong showing of the Openness Scale Score in the data, we can surmise that a higher level of Openness to new experiences allows users to more actively consider activities and systems outside of their normal scope, such has gamification. Psychologically there is opportunity to implement gamification aspects that appeal to certain psychological base types.

Qualitatively, the results speak to both the demographic and psychological correlations mentioned above. The user responses added depth to the quantitative results, helping delineate what the data was implying. The overall results suggested that users are the most vocal and particular concerning social aspects of games. Taking into account the Social, Co-op, Competitive, and Solo game mechanics, a robust view of user social motivation was established that spoke to the varying intents and needs of the individual players. In some instances users idealized the social mechanisms, stating that it was the

reason they played, and in others users avoided social interaction due to such psychological motivators as anxiety, fear of disappointment, and a heightened sense of individualism.

These differences spoke to the individual needs and desires of the participants in how gamification worked for them and how it could work better. Some desired more casual social options such as guild halls, which generally exist outside of any sort of cooperative/competitive game experience; others desired for variation and flexibility – the ability to chance the mechanics and content to fit their needs; and still others ought a more immersive experience. Taking into account the results splitting the research subjects into dynamic and security-seeking groups, these two facets could determine two base frameworks for gamification layers. The first, a quick-moving, adaptable platform that focuses on optional, involved social interaction, accomplishment tasks and tools for personal development. The second, for security-seeking groups, a more static platform that focuses more heavily on accomplishment/appreciation mechanics and incorporate narrative in order to engage employees beyond the extrinsic.

Strengths and Limitations of the Current Study

From the literature that was compiled and compared at the time of writing, there was little that dealt with gamification user indicators and preference at work. Koivisto and Hamari's (2014) work on preferences between gender, age, and length of use in gamification is the standout example in a relatively small pool, and even this did not apply to work preferences. As such there was ample room for more research. Using the Big Five Inventory as an evaluation tool also adds strength to the research as the BFI is a verified personality assessment with a high take-retake consistency (McCrae & Costa,

1987). In addition, a broad and anonymous set of users was polled, revealing a fair number of participants (19%, *n*=10) who did not play games outside of the gamification platform targeted. This adds depth to the results, ensuring that the responses are not overly skewed by participants already being predisposed to gameplay.

However, the study was limited by several factors. The survey was distributed across only a single gamification platform. As platforms tend to vary in subject and purpose, the users of one platform may have different preferences than users of another. There is the possibility that the results could be skewed by the surveyed platform's singularity and user preference for that. In addition, the gamification platform used was opt-in only. The users willingly engaged in interacting with the platform and it should be assumed that they went there by choice, indicating a predetermined desire to engage in gamification. Similarly, the high average Openness to Experience score of the BFI may be related to the overall users' choice to participate in gamification, being that those more Open to Experience are more likely to feel comfortable trying gamification. Extroversion may also be skewed, in that Introverts may be more comfortable interacting with others through a gamification interface than face-to-face.

Implications

The observed interplays of personality, demographics, and gamification have implications in organizational adoption and use of gamification platforms. Demographically, there were few direct correlations with gamification use. However the frequency of use and the implications there offer some insight into user-driven gamification mechanics. Namely this takes the form of Male/Female, Recreational/non-recreational game player, and time management. While the majority of participants were

female, the results of their preference scores and qualitative answers leaned heavily toward cooperative and general social interaction being important engagement factors. For males, general social interaction was also important, but there was more of an emphasis in competitive than cooperative play. So more team-based and collaborative elements may be better implemented for females, while males may be more engaged by leaderboards and other competitive gamification mechanics. In organizations where the broad employee base may be made to use gamification, and thus both game players and non-game players need to be accommodated there are some indications of preferences that may be useful. As the whole of the study sample indicated preference for solo play, social, badges and trophies, quick play, and narrative, incorporating these aspects may be beneficial for engaging all users. Specifically, given the frequencies and subjective responses, a platform that incorporates largely solo, self-driven play which awards trophies and/or badges for meaningful achievements, has social interactivity such that the users can decide how involved they choose to be and has both cooperative and competitive mechanics embedded in it. Underlying all of this, a simple yet deep narrative (for organization-based gamification this could take the form of the organizations story/mission) for engaging users on an emotional level. There are also implications for incorporating time management preferences in to gamification. As was shown in the scores of those who have children, those with less time prefer quick, less intense game mechanics. Also, desire for narrative falls suggesting that those with much to do and/or tight timelines are not as interested in story as much as getting things done.

Recommendations for Future Research

Given the limitations of the study there is ample opportunity for future research. The current study could be expanded to include multiple platforms utilizing both opt-in systems and those where participation is mandatory or incorporated into an organizations daily work routines. This can help to give a broader and deeper view of how the demographics and personality aspects key into the general populace. Further, as the sample was heavily skewed toward females, more research involving a more balances gender profile may aid in generating a good overall picture of indicators. To further this, future research could also focus on other skewed demographic indicators to see if there are difference in preference in those; specifically race. While the current literature has looked at age and gender, it has not looked at the implications of race in game and gamification use.

Conclusion

Through a critical and thorough analysis of gamification users, the implications and interplays of user demographics, personality, and preference emerged to shed light on how gamification influences workplace engagement. Through surveying the users of opt-in gamification platforms, valuable information was gleaned on how organizations may be able to better utilize gamification to engage their employees. In the world of gamification, the options are many and varied. The mechanics of one may differ significantly from those of another, and as such may differ significantly in which employees engage and which do not. A platform that emphasizes and requires direct social interaction may alienate more introverted employees, lowering their engagement rate and organizational commitment. Similarly, dynamic employees will have different priorities and usage desires than security-seeking ones.

All of this specificity speaks to an opportunity for gamification to be able to change modes and offerings for individual or group preferences. User-centered design, focusing on individual needs and outcomes has far more ability to engage users emotionally, intellectually, and personally than does organization-centered design, which takes into account only the needs of the organization. In order to fully engage employees, gamification creators and organizations deploying gamification systems, need to take into account the impact that certain gamification offerings may have on their employee base. Simply implementing a gamification layer is not enough. Without applying methods, mechanics, and genres that connect with employees and provide meaning within the context of the system, the system itself will create meaningless, hollow interactions. The emphasis should be on fully realized, meaningful interaction with the system and not gamification for gamifications sake, or for manipulative purposes. The conclusion is, that for gamification to work, it has to be meaningful (Deterding, 2011; Nicholson, 2012) and offer recognizable, if intangible, intrinsic value-added benefits to the user.

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Appendix A

ENGAGEMENT, GAMIFICATION, AND WORKPLACE SATISFACTION: A

CONVERGENT STUDY OF USER INDICATORS

A THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF MASTER OF ARTS IN LEADERSHIP STUDIES

UNIVERSITY OF SOUTHERN MAINE
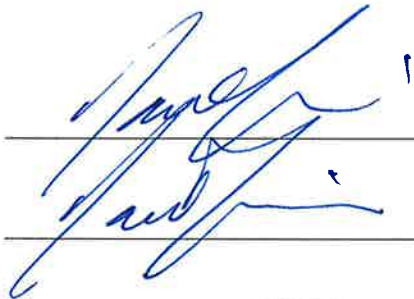
BY

Josiah Eikelboom

2016

FINAL APPROVAL FORM

THE UNIVERSITY OF SOUTHERN MAINE

5/6/2016

We hereby recommend that the thesis of Josiah Eikelboom entitled *Engagement, gamification, and workplace satisfaction: A convergent study of user indicators* be accepted in partial fulfillment of the requirements for the Degree of Master of Leadership Studies.

_____ Advisor

_____ Director

Accepted

_____

Dean, Lewiston-Auburn College

Appendix C

Demographic Indicators of Gamification Users (N = 53)

Indicator	n	%
Gender		
Female	39	74
Male	10	19
Transgender/Other	4	8
Relationship status		
Married or Cohabitating with a Significant Other	18	34
Single	35	66
Race		
White	40	76
Non-White	13	25
Highest education level completed		
Less than high school degree	1	2
High school degree or equivalent	7	13
Some college but no degree	8	15
Associate degree	2	34
Bachelor degree	22	42
Graduate degree	13	25
Have children under 18		
Yes	4	78
No	49	93
Annual household income ($)		
$0 to $9,999	4	8
$10,000 to $24,999	11	21
$25,000 to $49,999	8	15
$50,000 to $74,999	6	11
$75,000 to $99,999	6	11
$100,000 to $124,999	4	8
$200,000 and up	3	6
Prefer not to answer	11	21
Age at time of survey (years)		
18-20	7	13
21-29	30	57

30-39	10	19
40-49	6	11
Recreational gameplay (hours/week)		
None	10	19
1 to 3 hours	20	38
4 to 6 hours	9	17
7 to 9 hours	8	15
10 hours or more	6	11

Appendix D

Demographic Survey

Gamification Usage at Work
- Yes
- No (this answer will disqualify the taker)

Gender

- Male
- Female
- Transgender/Other

What is your age?

- 17 or younger (any choosing this option will be disqualified)
- 18 to 20
- 21 to 29
- 30 to 39
- 40 to 49
- 50 to 59
- 60 or older

Ethnicity

- African American
- Asian
- American Indian/Alaskan Native
- Native American/Pacific Islander
- Caucasian/White
- From multiple races
- Other race:
- Prefer not to say

What is your current household income in U.S. dollars?

- Under $20,000
- $20,000 - $29,999
- $30,000 - $39,999
- $40,000 - $49,999
- $50,000 - $74,999
- $75,000 - $99,999

- $100,000 - $150,000
- Over $150,000

What is the highest degree or level of education you have completed?

- Less than high school
- High school graduate (includes equivalency)
- Some college, no degree
- Associate's degree
- Bachelor's degree
- Ph.D.
- Graduate or professional degree

What is your marital status?

- Single (never married)
- Married
- Separated
- Widowed
- Divorced

Do you have any children under the age of 18?

- Yes
- No

On an average day, roughly how many hours do you spend using gamification at work?
- None (this selection will skip the remainder of the demographic questions that pertain to game playing habits and preferences)
- 0-2 hours
- 3-5 hours
- 6-8 hours
- 9 or more

In the past 7 days, roughly how many hours have you spent playing video games recreationally (e.g. gaming consoles, mobile phones, computers, etc.)?

- None (this selection will skip the remainder of the demographic questions that pertain to game playing habits and preferences)
- 0-3 hours
- 4-6 hours
- 7-9 hours
- 10 or more

What elements do you prefer to see in games (select all that apply)?

- Social elements (e.g. trading, gifting, chatting, group play, character interaction and friending)?
- Competitive elements (e.g. leaderboards, pvp, and top-tier rewards)?
- Reward elements (e.g. points, power-ups, level-ups, trophies, and titles)?
- Individual elements (e.g. avatars, character creation, building, crafting, and solo play)?
- Open-ended elements (e.g. sandbox worlds, exploration, and non-linear story telling)?

What genres of game do you prefer to play (select all that apply)?

- Role Playing
- Adventure
- Building/Resource Management
- First Person Shooter
- Strategy
- Casual
- Board and Card
- Puzzle

Appendix E

The Big-five Inventory (BFI)

How I am in general

Here are a number of characteristics that may or may not apply to you. For example, do you agree that you are someone who *likes to spend time with others*? Please write a number next to each statement to indicate the extent to which **you agree or disagree with that statement.**

1	2	3	4	5
Disagree Strongly	Disagree a little	Neither agree nor disagree	Agree a little	Agree strongly

I am someone who…

1. _____ Is talkative

2. _____ Tends to find fault with others

3. _____ Does a thorough job

4. _____ Is depressed, blue

5. _____ Is original, comes up with new ideas

6. _____ Is reserved

7. _____ Is helpful and unselfish with others

8. _____ Can be somewhat careless

9. _____ Is relaxed, handles stress well.

10. _____ Is curious about many different things

11. _____ Is full of energy

12. _____ Starts quarrels with others

13. _____ Is a reliable worker

14. _____ Can be tense

15. _____ Is ingenious, a deep thinker

16. _____ Generates a lot of enthusiasm

17. _____ Has a forgiving nature

18. _____ Tends to be disorganized

19. _____ Worries a lot

20. _____ Has an active imagination

21. _____ Tends to be quiet

22. _____ Is generally trusting

23. _____ Tends to be lazy

24. _____ Is emotionally stable, not easily upset

25. _____ Is inventive

26. _____ Has an assertive personality

27. _____ Can be cold and aloof

28. _____ Perseveres until the task is finished

29. _____ Can be moody

30. _____ Values artistic, aesthetic experiences

31. _____ Is sometimes shy, inhibited

32. _____ Is considerate and kind to almost everyone

33. _____ Does things efficiently

34. _____ Remains calm in tense situations

35. _____ Prefers work that is routine

36. _____ Is outgoing, sociable

37. _____ Is sometimes rude to others

38. _____ Makes plans and follows through with them

39. _____ Gets nervous easily

40. _____ Likes to reflect, play with ideas

41. _____ Has few artistic interests

42. _____ Likes to cooperate with others

43. _____ Is easily distracted

44. _____ Is sophisticated in art, music, or literature

SCORING INSTRUCTIONS

To score the BFI, you'll first need to **reverse-score** all negatively-keyed items:

Extraversion: 6, 21, 31
Agreeableness: 2, 12, 27, 37
Conscientiousness: 8, 18, 23, 43
Neuroticism: 9, 24, 34
Openness: 35, 41

To recode these items, you should subtract your score for all reverse-scored items from 6. For example, if you gave yourself a 5, compute 6 minus 5 and your recoded score is 1. That is, a score of 1 becomes 5, 2 becomes 4, 3 remains 3, 4 becomes 2, and 5 becomes 1.

Next, you will create scale scores by *averaging* the following items for each B5 domain (where R indicates using the reverse-scored item).

Extraversion: 1, 6R 11, 16, 21R, 26, 31R, 36
Agreeableness: 2R, 7, 12R, 17, 22, 27R, 32, 37R, 42
Conscientiousness: 3, 8R, 13, 18R, 23R, 28, 33, 38, 43R
Neuroticism: 4, 9R, 14, 19, 24R, 29, 34R, 39
Openness: 5, 10, 15, 20, 25, 30, 35R, 40, 41R, 44

SPSS SYNTAX

*** REVERSED ITEMS

```
RECODE
  bfi2 bfi6 bfi8 bfi9 bfi12 bfi18 bfi21 bfi23 bfi24 bfi27 bfi31 bfi34 bfi35
  bfi37 bfi41 bfi43
  (1=5) (2=4) (3=3) (4=2) (5=1) INTO bfi2r bfi6r bfi8r bfi9r bfi12r bfi18r bfi21r bfi23r bfi24r
  bfi27r bfi31r bfi34r bfi35r bfi37r bfi41r bfi43r.
EXECUTE .
```

*** SCALE SCORES

```
COMPUTE bfie = mean(bfi1,bfi6r,bfi11,bfi16,bfi21r,bfi26,bfi31r,bfi36) .
VARIABLE LABELS bfie 'BFI Extraversion scale score.
EXECUTE .
```

```
COMPUTE bfia = mean(bfi2r,bfi7,bfi12r,bfi17,bfi22,bfi27r,bfi32,bfi37r,bfi42) .
VARIABLE LABELS bfia 'BFI Agreeableness scale score' .
EXECUTE .

COMPUTE bfic = mean(bfi3,bfi8r,bfi13,bfi18r,bfi23r,bfi28,bfi33,bfi38,bfi43r) .
VARIABLE LABELS bfic 'BFI Conscientiousness scale score' .
EXECUTE .

COMPUTE bfin = mean(bfi4,bfi9r,bfi14,bfi19,bfi24r,bfi29,bfi34r,bfi39) .
VARIABLE LABELS bfin 'BFI Neuroticism scale score' .
EXECUTE .

COMPUTE bfio = mean(bfi5,bfi10,bfi15,bfi20,bfi25,bfi30,bfi35r,bfi40,bfi41r,bfi44) .
VARIABLE LABELS bfio 'BFI Openness scale score' .
EXECUTE .
```

REFERENCE INFORMATION

The BFI should be cited with the original and a more accessible, recent reference:

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Appendix F

Qualitative Survey Questions

1. Do you feel engaged in your present workplace role?

2. Where do you see yourself in the next year? The next five?

3. How does using gamification at work make you feel? Please explain.

4. In question 9 of the demographic survey you specified certain elements that you enjoy. (this question will be linked to question 9 so that the answers flow in as reference points)

> a) What is it about these particular elements that you enjoy?
> b) What elements do you not enjoy? Why?

5. If there was something that you could change in the gamification system, what would it be?
6. How satisfied are you with your job?

7. What would make you more satisfied? Less?

8. If there was something you could change about your workplace, what would it be?