

Emerging Research and Trends in Gamification

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A volume in the Advances in Multimedia and
Interactive Technologies (AMIT) Book Series

Information Science
REFERENCE

An Imprint of IGI Global

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Published in the United States of America by
Information Science Reference (an imprint of IGI Global)
701 E. Chocolate Avenue
Hershey PA, USA 17033
Tel: 717-533-8845
Fax: 717-533-8661
E-mail: cust@igi-global.com
Web site: <http://www.igi-global.com>

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Library of Congress Cataloging-in-Publication Data

Emerging research and trends in gamification / Harsha Gangadharbatla and Donna Z. Davis, editors.
pages cm

Includes bibliographical references and index.

Summary: "This book brings together innovative and scholarly research on the use of game-based design and technology in a variety of settings, including discussions from both industry and academic perspectives"-- Provided by publisher.

ISBN 978-1-4666-8651-9 (hc) -- ISBN 978-1-4666-8652-6 (eISBN) 1. Games--Social aspects--Research 2. Computer games--Social aspects--Research. I. Gangadharbatla, Harshavardhan. II. Davis, Donna Z., 1959-

GV1201.38.E64 2016

794.80072--dc23

2015015652

This book is published in the IGI Global book series Advances in Multimedia and Interactive Technologies (AMIT) (ISSN: 2327-929X; eISSN: 2327-9303)

British Cataloguing in Publication Data

A Cataloguing in Publication record for this book is available from the British Library.

All work contributed to this book is new, previously-unpublished material. The views expressed in this book are those of the authors, but not necessarily of the publisher.

For electronic access to this publication, please contact: eresources@igi-global.com.

Chapter 7

Gamifying Recruitment, Selection, Training, and Performance Management: Game-Thinking in Human Resource Management

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ABSTRACT

Game-thinking is beginning to appear in a wide variety of non-game contexts, including organizational support settings like human resource management (HRM). The purpose of this chapter is two-fold: 1) to explore the opportunities for game-thinking via gamification and serious games in HRM based on current and previous HRM literature and 2) to identify future research areas at the intersection of game-thinking and HRM. Prevailing HRM theories will be applied to the use of game-thinking in different sub-fields of HRM, including recruitment, selection, training, and performance management.

INTRODUCTION

Game-thinking is beginning to appear in a wide variety of non-game contexts. Game-thinking has been described as an umbrella term encompassing gamification, serious games, game-inspired design, and play that can be used to solve some sort of problem (Marczewski, 2014). For the purposes of this chapter, the two major forms of game-thinking are gamification, defined as the use of game elements in non-game

DOI: 10.4018/978-1-4666-8651-9.ch007

Gamifying Recruitment, Selection, Training, and Performance Management

contexts (Deterding, Sicart, Nacke, O'Hara, & Dixon, 2011) and serious games, defined as games used for a primary goal other than entertainment (Michael & Chen, 2005). Gartner Inc. (2011) predicted that by 2014, 70 percent of Global 2000 organizations would have at least one gamified application and that by 2014, 80 percent of all gamified applications would fail (Gartner Inc., 2012). Considering the rising trend in gamified applications and the stakes at hand for businesses, organizations, and government, it is crucial to research game-thinking in organizational contexts.

Gamification has often been used in marketing (see, e.g., Sarner, 2013) and sales (see, e.g., Chapman, 2014). For example, online advertisements in the past decade and beyond employed simple point-and-click games (e.g. clicking a moving target on screen) to push marketing content onto consumers. The field of sales appears to be the simplest field to gamify, as many sales teams have employed points and leaderboard game mechanics to inspire competition among salespersons (e.g., Bunchball, 2013). Although these areas may see the most ubiquitous gamification, serious games and game elements can also be used in organizational support settings – namely, human resource management (HRM; DuVernet & Popp, 2014). Recent reports by organizations studying and applying HRM theory have identified gamification as a top trend in the field (Munson, 2013; Society for Human Resource Management, 2014), with research beginning to appear at professional conferences in the past two years (Landers, 2013; Bauer, Callan, Cavanaugh & Landers, 2014; Callan, Bauer, Armstrong, & Landers, 2014; Chow & Chapman, 2014; Geimer & O'Shea, 2014; Kubisiak, Stewart, Thornbury, & Moye, 2014; Popp, 2014; Sydell & Brodbeck, 2014).

The purpose of this chapter is two-fold: 1) to explore the opportunities for gamification and serious games in HRM based on current and previous HRM literature and 2) to identify future research areas at the intersection of game-thinking and HRM. Prevailing HRM theories will be applied to the use of game-thinking in different sub-fields of HRM. Empirical research will be considered when available, although the current empirical literature on gamification is sparse (Hamari, Koivisto, & Sarsa, 2014). Where empirical studies of game-thinking in HRM are absent, case studies of organizations using serious games and game elements will be discussed.

An important consideration in the gamification of HRM is to identify which game elements might be applied to non-game contexts whether individually or in combination up to a complete serious game. Bedwell, Pavlas, Heyne, Lazzara, and Salas (2012) developed a taxonomy of game elements used in learning contexts. These elements are broad in scope, incorporating larger more detailed taxonomies of game elements within it (Wilson et al., 2009). Although these taxonomies were developed with serious games in mind, the elements can be applied to gamified contexts broadly. By understanding what elements can be applied to HRM contexts, game-thinking can be better leveraged to improve HRM outcomes. The game elements identified by Bedwell and colleagues and referenced by this chapter include action language, assessment, conflict/challenge, control, environment, game fiction, human interaction, immersion, and rules/goals.

This chapter will explore four major areas of HRM where serious games and gamification have already seen some success. These areas include recruitment, selection, training, and performance management. The first of these areas, recruitment, is defined as “those organizational activities that (1) influence the number and/or types of applicants who apply for a position and/or (2) affect whether a job offer is accepted” (Breaugh, 1992, p. 4). In the second area, selection, organizations provide psychological assessments to applicants in order to use their scores to predict later job performance and thus aid in hiring decisions. Such assessments might include tests of cognitive ability, assessments of personality, work samples, interviews, application blanks, and more. The third area, training, is defined as “activi-

ties leading to the acquisition of knowledge, skills, and attitudes relevant to an immediate or upcoming job or role” (Kraiger & Culbertson, 2013, p. 244). Such activities might include an educational course, job shadowing a current employee, or on-the-job training under close supervision. Once training is complete and an employee is working within the organization, performance levels must be maintained in order to reach organizational outcomes (e.g. product quotas, financial objectives, etc.). The final area, performance management, is defined as “a continuous process of identifying, measuring, and developing the performance of individuals and teams and aligning performance with the strategic goals of the organization” (Aguinis, 2009, p. 2). It includes identifying what good performance is for a given job, consistently assessing employees on that criterion, and ensuring that employees are maintaining a specified level of performance.

Game-thinking can be used within each of these four areas of HRM to benefit organizations. Within recruitment, serious games can portray different aspects of the recruiting organization to potential applicants by immersing them within the organization, persuading them to apply or accept a job offer. Game-like assessments can be utilized within selection systems to identify the best applicants for the job. Gamified training can challenge new hires to learn more during training, benefitting both the employee and the organization in the long term. Gamification also can be applied to everyday work performance, motivating employees to higher qualities and quantities of work output. For example, performance leaderboards combine elements of conflict/challenge, assessment, and rules/goals to motivate employees (Landers & Landers, 2014). Each of these applications is addressed more in-depth in the remainder of this chapter.

RECRUITMENT

Current Research

Game-thinking can be applied to the context of employee recruitment through two processes. First, game-thinking can be applied to the process of finding the best “fit” between applicants and hiring organizations. Generally, if organizations are more attractive to potential applicants, those organizations will receive more applications for jobs. Also, if organizations are more attractive to applicants, those applicants might be more likely to accept a position with that organization if offered. Second, game-thinking can be applied to the recruitment process itself. Serious games and gamified applications can be used to relay information among job seekers about available positions.

Gamification of Applicant Fit

Serious games and gamified applications can be used to help job applicants determine their person-organization fit (Cable & Judge, 1996; Kristof, 1996; O’Reilly, Chatman, & Caldwell, 1991) with the recruiting organization. Organizations present an image of themselves to potential applicants hoping that applicants will see the organization as a desirable place to work, matching or exceeding their expectations for an employer. This can be accomplished in two major ways.

First, organizations might try to enhance person-organization fit by applying the attraction-selection-attrition framework (Schneider, 1987). Individuals seeking employment are generally attracted to organizations that represent similar beliefs, personalities, and behaviors to their own. Similarly, organizational recruiters are attracted to recruits similar to the people within their organization. Ideally, when this at-

Gamifying Recruitment, Selection, Training, and Performance Management

traction is mutual, recruits are invited to apply to an organization. Gamified applications and recruiting techniques might be leveraged to make an organization more attractive, thus drawing more job applicants to an organization. For example, Deloitte China utilized game elements to enhance its organizational attractiveness to potential applicants during a recent recruiting campaign (Ordioni, 2013). Company offices in Beijing, Hong Kong, and Shanghai were virtually rendered, allowing job seekers to explore different aspects of jobs in the company. Users took part in a virtual tour of the organization, which utilized the game elements of immersion, environment, and control. Job seekers were immersed in a virtual version of the offices, able to navigate to different rooms, floors, and buildings. This virtual tour provided the environment of a Deloitte China office to any job seeker with a computer and Internet access. Users were given control over how to tour the organization. Job seekers could explore every aspect of the company available (e.g. reception, office environment, training), or they could focus their attention on a specific department (e.g. finance) or location (e.g. Shanghai). Additionally, the application included a challenge element to find “Green Dots” throughout the company, representing different benefits and opportunities available to employees in the company (e.g. development opportunities, career flexibility). The Deloitte China Virtual Tour campaign has received over 32,000 visitors since its inception (Deloitte, 2014).

Although this framework appears advantageous to the organization, there are potential negative consequences. Organizations might enhance their attractiveness to potential applicants with serious games or game elements to such an extent that potential applicants are misinformed about the true nature of the organization. For example, a serious recruiting game might demonstrate that an organization is environmentally conscious when in reality it is not. If an applicant desires to work for an environmentally conscious organization, they may be attracted to this organization, apply, and be selected. The organization has accomplished its goal with the recruitment game, but the new hire will soon realize that the organization is not environmentally friendly, thus increasing the probability of attrition (Schneider, 1987). The employee might leave the organization to which he or she is no longer attracted in order to join a more attractive one (Hamori, 2010; Darnold & Rynes, 2013).

Second, organizations might try to enhance person-organization fit by providing a realistic job preview (Wanous, 1973) within the context of a serious game. One example is America’s Army (2014), a game developed by the U.S. Army to recruit young Americans by previewing the more exciting aspects of the soldier experience, while simultaneously demonstrating Army career opportunities and benefits. Players might perceive themselves as a good fit for the U.S. Army based upon their success in the serious game. To the extent that gameplay skills represent real-life social skills, this approach will invite a more qualified applicant pool than previously available.

Gamification of the Recruitment Process

Game-thinking also may be employed to enhance the recruitment process itself. Making recruitment processes more game-like or into complete serious games can motivate employees to recruit new applicants or involve potential applicants in the workings of the recruiting organization. These objectives are accomplished through gamified employee referral systems and through competitions among potential applicants.

Gamification can be employed to improve employee referral systems. For example, software developer Herd Wisdom created a mobile application to gamify the employee referral system by awarding points and prizes to employees for recruiting new applicants (Herd Wisdom, 2013). Points are earned by employees for various behaviors (e.g., updating a user profile, sharing job postings) within the ap-

plication. Earning points through this system then increases employees' chances of winning giveaway contests within the recruiting company (e.g., a tablet computer might be awarded every month to a participating employee, with more participation points translating into more chances of winning). This form of gamification aims to motivate employees to put forth more effort into the recruitment process, improving the applicant pool by increasing the number of applicants.

The recruitment process also can be gamified through the use of competition. Competitions can include elements of challenge or conflict, as well as human interaction when players are competing against other people. For example, the U.S. Department of Homeland Security hosted a competition for high school student computer hackers in order to meet its estimated computer security employee needs (Perlroth, 2013). The competition was designed to excite young hackers about working in the government sector, hopefully for the Department of Homeland Security. The competition was divided into stages, allowing the best participants to progress through each stage, concluding with prize money for the top contenders. As the competition occurred, live-updating leaderboards tracked participant points. Points were earned for tasks such as cracking passwords, flagging security vulnerabilities, and more. Over 700 high school students participated in the earliest stage of the competition, and the 40 highest-scoring students progressed to more advanced stages, which also involved increasingly realistic government computer security issues. The competition and the associated prize money presumably motivated potential job applicants to participate. In the process, students learned more about the government sector of computer security and the recruiting organization.

Future Research

Future research on game-thinking in recruitment should examine how different serious games and game elements can increase or decrease organizational attractiveness. The element challenge/conflict might be used in a serious recruitment game to attract competitive applicants to the organization. However, some applicants might dislike games with challenge/conflict elements that are too difficult. Research should examine the interaction between the individual differences of potential applicants (e.g. attitudes toward challenges/conflicts) and game elements used in recruiting. Future research also should explore how serious games and game elements can portray truthful or false representations of recruiting organizations. For example, researchers might examine how the element immersion can be used to immerse potential applicants in either realistic or positively exaggerated virtual versions of the organization.

Additionally, the effectiveness of gamified recruitment processes should be examined and evaluated. Gamified employee referral systems might be more or less effective with different combinations of game elements. Further, different operationalizations of the same element might have different effects on employee recruitment. For example, the element assessment might be used in an employee referral system in several different ways. Employees may receive points according to the number and quality of referrals they provide. Alternatively, employees might earn badges for completing certain referral goals. A third form might be a progress bar, displaying how much progress has been made toward reaching an individual or organization-wide referral goal. When testing the effectiveness of different forms, care should be taken to isolate the effects of other elements or variables (e.g. the effect of points as an assessment itself might be confounded by the effect of competition among employees). Research should also investigate whether gamified recruitment is more or less effective than traditional recruiting methods. Chow (2014) found that standard online recruitment material led to better recruitment outcomes than gamified recruitment material. Future studies are necessary to confirm or disconfirm this effect.

Gamifying Recruitment, Selection, Training, and Performance Management

Finally, models of gamified recruitment should be developed and tested. One such model has been developed by Chow and Chapman (2013), who examined the effects of gamification on recruit attitudes and affect toward organizations. The model proposed that affect and attitudes influenced overall attitudes toward the recruiting organization over time, which then influenced applicant attraction to the organization. Such models should be expanded to include other known predictors of recruitment outcomes, such as attraction to an organization and likelihood of accepting a job offer. Other models of gamified recruitment should consider person-organization fit in its various forms (Kristof, 1996) and how to maximize these outcomes with serious games and game elements.

SELECTION

Current Research

Selection research has traditionally focused on the validity of selection predictors and methods, and in the U.S., attempted to find a balance between adversely impacting protected classes (Equal Employment Opportunity Commission, 1978) and effectively predicting job performance while maintaining positive reactions to the selection process itself. Game-thinking can impact all three of these areas. By adding game elements, fairness perceptions of selection assessments might be generally improved over traditional methods (i.e. personality tests, online surveys, etc.). In regards to test validity, serious games and gamified assessments might provide new insight into the prediction of job performance.

Gamification of Applicant Reactions to Selection

Applicants who perceive selection systems as unfair react negatively to those systems, and these effects can persist after hiring. Specifically, application processes that are perceived as unfair can result in increased test anxiety and decreased test motivation (Hausknect, Day & Thomas, 2004), possibly skewing the results of assessments used in selection. The perceptions of unfair selection systems are described by organizational justice theory. This theory states that the distribution of rewards (distributive justice, e.g., which of the applicants received a job offer) and the procedures by which that distribution occurred (procedural justice, e.g., how job offers to applicants were determined) drive the overall fairness perceptions of applicants. When fairness perceptions are poor, a variety of negative selection-related outcomes for the organization are more probable, including decreased applicant self-efficacy and self-esteem, decreased organizational attractiveness, decreased job offer acceptance, and eventually decreased job satisfaction, decreased performance, and increased turnover. Exceptionally poor fairness perceptions may even increase the probability of litigation against the organization (Bauer, Truxillo, Sanchez, Craig, Ferrera, & Campion, 2001).

Applicant reactions to the use of new technologies in selection, including serious games and gamification, are driven by these perceptions. Recent research on the impact of new technologies in selection have found procedural justice perceptions to mediate the relationship between technology usage and applicant reaction outcomes (i.e., test-taking motivation, organizational attraction, intentions toward the organization; Bauer et al., 2006; Weisheimer & Giordano, 2013). However, computer experience emerged as a key moderator of this relationship, revealing a stronger relationship between procedural justice perceptions and outcomes among those with greater experience with computers. Experience

with technology also appears to be generally important when considering reactions to technology more broadly. For example, people are more likely to react positively to the idea of gamification when they have previous gaming experience and positive attitudes toward serious games (Landers & Armstrong, in press). Conversely, those with little or no experience with games may view the use of serious games in a high-stakes context as inherently unfair. Even those with game experience may view the use of serious games and gamification in a high-stakes context like selection as unfair if the serious game or gamification is poorly designed or executed. Perceptions that a game is unfair or unwinnable may create perceptions that the overall selection process is unfair, even if game performance validly predicts job performance. If such perceptions vary by protected class membership, such games may even invite litigation.

The use of game-thinking to improve applicant reactions often involves the deployment of a complete serious game for maximum positive impact upon reactions. One example of this is *Insanely Driven* (less rain, 2014; <http://insanelydriven.archive.lessrain.co.uk/>), an interactive selection game in which each job applicant is placed into a series of unusual situations and asked to make a variety of decisions. The situations differ widely from content typically expected in any hiring process, requiring decisions regarding stained shirts and aliens, among others. At the conclusion of the game, a personality profile is produced based upon those responses. At a minimum, *Insanely Driven* is a highly memorable selection experience. Although data are not yet available on the success of this system in improving applicant reactions, the game has attracted a fair amount of media coverage.

Gamification of Assessment

In addition to improving applicant reactions to selection systems, game-thinking may be used as a replacement or supplement to traditional performance assessments. Ideally, serious games or gamified assessments would improve the quality of information about job candidates obtained during the selection process. For example, performance on a serious assessment game might be used to assess knowledge, skills, abilities, and other characteristics of job candidates. Such individual differences can already be assessed with psychological tests to effectively predict job performance (Schmidt & Hunter, 1998). However, serious games might be used to obtain higher quality data in one of two ways. First, serious game performance may be more difficult for test-takers to fake in an effort to maximize their chances to be hired. Second, serious games may be better able to elicit behaviors than traditional questionnaire-based assessments.

Response distortion on non-cognitive measures has long been a concern in the hiring process (Ones & Viswesvaran, 1998). When a test outcome is high-stakes, such as during the job application process, many test-takers distort their responses in a variety of intentional and unintentional ways. Some test-takers create a social desirability bias (Ganster, Hennessey & Luthans, 1983) when they unintentionally inflate their responses from their true scores in order to present themselves in a socially desirable fashion. Other test-takers engage in intentional distortion, such as blatant extreme responding, in which test-takers respond only with extreme answers in a purposeful attempt to inflate their scores (Landers, Sackett & Tuzinski, 2011). Gamification of the assessment process may reduce the magnitude of both effects because desirable behaviors within the serious game may be less obvious to players. For example, personality traits might be assessed indirectly via gameplay behaviors, such behaviors may be less susceptible to social desirability bias, and due to the ambiguous nature of their measurement, may also be more difficult for test-takers to manipulate purposefully.

Gamifying Recruitment, Selection, Training, and Performance Management

Serious games may also elicit job-relevant behavior more readily than is possible with questionnaires. Non-cognitive survey-based hiring measures (e.g. personality surveys, interest inventories) ask that job applicants reflect upon themselves and respond based upon their judgment about their own capabilities. Several efforts to minimize the effects of inaccuracy introduced by this reflection while maintaining the otherwise strong psychometric properties of surveys have been made, most notably the use of situational judgment tests (Landy, 2007), which require test-takers to predict their future behavior rather than reflect upon their existing psychological traits and states. Serious games as assessment tools may show similar benefits. Specifically, past behavior is generally considered the best predictor of future behavior (Ajzen, 1991). By eliciting job-relevant behavior within the context of a serious game, better prediction of future work behavior may be possible than by using survey-based measures alone. Consulting company PDRI employed a gamified simulation to assess candidates on learning agility, the willingness and ability to learn from experience, in addition to self-report measures (Kubisiak et al., 2014). Willingness to learn was assessed via self-report surveys, while ability to learn was assessed via simulation. Different phases of the fictional simulation tested participants on their perception of facts, comprehension of rules, recognition of patterns, and more while solving a mystery (i.e. game fiction element combined with a challenge/goal element) about a stolen rare coin. Game-like assessments like PDRI's simulation can be used to observe and measure valuable predictor constructs like learning agility in a selection context where survey methodology may not suffice.

With either approach to gamifying assessment, minimization of negative reactions and maximization of beneficial psychometric properties is needed for legal defensibility and maximum utility. This is best ensured through the processes described by the various seminal documents on test validation, including those produced by the Equal Employment Opportunity Commission (1978), the Society for Industrial and Organizational Psychology (2003) and the joint efforts of the American Educational Research Association, American Psychological Association, and National Council on Measurement in Education (1999). These guidelines, commonly cited in selection cases within the U.S. legal system, provide specific guidelines for the creation of psychometrically valid assessment tools. Specifically, tests must be reliable, valid, and fair.

Reliable tests show high consistency of measurement, and reliability is necessary to establish validity. This is of particular concern in the context of the gamification of assessment, because serious games should produce similar scores for applicants regardless of their past experience (or lack thereof) with the game. For example, the number of times a person completes a personality measure should not affect their personality score. In contrast, a person's score from an assessment game may increase as they increase their experience with the game, which decreases the reliability of the scores (Cronbach, 1951) obtained from it, confounding observed scores with game experience. Serious game designers must be careful to ensure that game skill does not influence the scores obtained from the game. If applicants can increase their scores with repeated play, those with the greatest game skill or those willing to play the game many times, either of which may correlate with protected class membership (e.g., applicant sex), will ultimately be hired, increasing litigation risk.

A test must also be valid, measuring only the constructs it is intended to measure and predicting job performance adequately. Valid prediction is necessary for legal defensibility; if the test scores do not predict job performance and do not correlate with protected class membership, there is a high risk of litigation. This is also difficult in the serious assessment game context, because most serious games are intended to elicit a wide range of highly complex skills. Whereas a psychological measure can be designed to assess a single personality trait, designing serious games to measure a single construct may be more difficult

and is contrary to the typical game design process, which emphasizes a variety of interesting tasks to maximize player engagement (Schell, 2008). In this way, the reliability and validity of serious selection games may be at odds with the entertainment value provided by such games.

Finally, serious assessment games should be fair. A common concern in the legal systems of many countries is adverse impact, the unintentional discrimination against members of groups within protected classes (see Equal Employment Opportunity Commission, 1978). In the U.S., this most typically involves race, sex, religion, national origin, color, disability status, and age. If a test results in lower scores for one group within these categories versus another (e.g. within sex, males versus females), it demonstrates adverse impact. This adverse impact may or may not be legal, depending upon the legal system of the nation within which it is used. Of particular concern in serious assessment games is the use of first-person shooters, in which males on average have greater interest and experience than females (Jansz & Tanis, 2007). If such a game were used in the selection process, it is probable that female applicants would perform more poorly on those games due not to lower standing on target individual constructs, but instead due to less game experience. Such differences must be investigated before serious assessment games can be safely used in many countries.

Future Research

The gamification of applicant reactions, that is, the use of game elements to improve reactions, has been explored somewhat, but this research is not typically called “gamification.” For example, the use of progress bars to track progression through a survey does not appear to increase response rates but may reduce test-taker anxiety (Singh, Taneja & Mangalaraj, 2009). In the study of situational judgment tests, branching has been used to provide later question prompts in direct response to applicant responses to earlier question prompts (Lievens, Peeters, & Schollaert, 2007). For example, in a situational judgment test about managerial skill, a test-taker asked to resolve a conflict between a male and a female coworker in an early question might be asked later questions based upon that response. This mimics the element “game fiction,” or “narrative,” commonly used in gamification efforts (see, e.g., Nicholson, 2013). Future research in the gamification of reactions must consider which game elements are likely to elicit which effects on reactions, isolating these effects, and measuring them carefully. An integration of Hausknecht and colleagues’ (2004) theory of applicant reactions along with theories of meaningful game elements (see, e.g., Landers, 2014; Landers & Landers, 2014) is needed as a next step.

Current research on the use of complete, developed serious games in selection is in its infancy. The basic psychometric properties of effective serious selection games and the design process to ensure favorable properties have not been established. Future research should target each of the major psychometric properties of serious games and the game development process necessary to establish this. A research program should entail investigations of reliability, validity, and fairness.

First, the reliability of scores obtained from serious games must be established. Core to measurement theory is that a construct representing an individual characteristic of interest drives behavior within an assessment (Nunnally, 1978). If the construct does not change, scores obtained to measure that construct through a serious game should not change either. This indicates a need for both over-time examinations of scores obtained from video games (i.e., that scores stay the same from play session to play session to ensure test-retest reliability) as well as within-game examinations (i.e., that scores are similar between exercises focusing upon the same construct in order to assess internal consistency reliability).

Gamifying Recruitment, Selection, Training, and Performance Management

Second, the validity of scores obtained from serious games must be established. Even if reliability can be demonstrated, whatever is measured via serious games must be the construct intended to be measured when designing the game. This has been a critical problem in several selection-related literatures, notably interviews (Salgado & Moscoso, 2002), assessment centers (Arthur, Woehr & Maldegen, 2000), and situational judgment tests (Cabrera & Nguyen, 2001). In each of these literatures, a selection technique was found not to assess the constructs it was originally intended to measure, which is contrary to the guidelines of the Equal Employment Opportunity Commission, the Society for Industrial and Organizational Psychology, the American Educational Research Association, the American Psychological Association, and the National Council on Measurement in Education, as described earlier. No documented design process is in place to ensure that a developed serious game actually measures what it is intended to measure, which makes this a high priority for future research.

Third, the adverse impact of scores obtained from serious games must be investigated. A variety of demographic differences have been found in the popularity of games, broadly (Greenberg, Sherry, Lachlan, Lucas & Holmstrom, 2010). It is unknown if these preferences and varying experience levels with various game types affect the success of serious games in providing accurate measurement, making this a high priority for future research as well. Any investigations of reliability and validity would benefit from inclusion of demographics measures for this investigation, especially gender and prior experience with games.

TRAINING

Current Research

The study of serious games in learning contexts has existed for several decades (see, e.g., Malone, 1981). Because of the successes in utilizing serious games for learning, game-thinking is poised to have a substantial impact on learning outcomes in workplace training. In the field of training, game-thinking has been applied to both improving overall training effectiveness and to improving motivation during training. Game-thinking in training can have an impact on learning and organizational outcomes. Game-thinking also can serve as a motivational tool, increasing training completion rates and trainee motivation to learn.

Gamification of Training Effectiveness

Those attempting to gamify training effectiveness intend to improve trainee reactions to learning, knowledge and skill increases, behavioral change, and organizational return (Kirkpatrick, 1976). Research in this domain is generally concerned with research on serious games. It is important to note that such games are not always digital; serious games have been used to support learning for decades, long before video games even existed as a major form of entertainment (Keys & Wolfe, 1990). This research area is primarily within the educational domain rather than within human resource management. However, effectiveness in the educational domain typically focuses upon the affective reactions to students and learning as the ultimate outcomes of instruction, whereas behavioral change and return on investment are actually the ultimate focus for organizations (Burke & Hutchins, 2007). This distinction is critical.

In the human resources context, this distinction implies additional points of failure for a gaming-driven training program that do not exist in education because the ultimate effect on behavior is not typically

considered in education. To illustrate this, Landers and Callan (2012) proposed a technology-enhanced training effectiveness model (TETEM), demonstrating that poor trainee attitudes toward new technologies, low trainee experience with training technologies, and poor organizational climate for training technologies can reduce reactions to training, learning from training, behavioral transfer from training, and organizational return on investment, even if the technology itself has been implemented effectively. In the present context, this means that a well-designed serious game can still fail to produce desired training outcomes if trainees are not properly motivated to engage with that game.

Landers and Armstrong (in press) tested a portion of this model in the gamification context by asking potential learners how they would feel about gamified instruction in comparison to traditional PowerPoint-based instruction, finding that those with low video game experience and poor attitudes toward game-based learning still preferred PowerPoint to serious games. Despite this, overall reactions to training were still greater for gamified training, implying that although some individuals are likely to be disadvantaged by gamification in comparison to traditional training designs, overall reactions will still be stronger when serious games are used. Effects upon other organizational training effectiveness outcomes, like transfer and return, were not examined.

Even when the training context is ideal, there is little consensus on what specific game elements or game designs actually support learning (Bedwell et al., 2012; Guillen-Nieto & Aleson-Carbonelli, 2012). A common approach in designing serious games is to create an experience in which desired skills are demonstrated through gameplay. When the game-version of skill demonstration is nearly identical to the real-life skill upon which it is modeled, these are sometimes called “simulation games”. A major drive of the difficulties defining games or what makes them successful stems from the extreme complexity surrounding game design, which can involve thousands of people, from graphic designers, writers, and level designers through a variety of directors, managers, and producers (Schell, 2008).

As described in the introduction to this chapter, Bedwell and colleagues (2012) developed a taxonomy of game elements used in learning contexts. Although this is not an exhaustive list of game elements, it is an exhaustive list of game elements typically used to influence learning, making it a prime starting point to understand what about games can improve training effectiveness. Unfortunately, research in this domain is just beginning, and conclusions about which of these elements are most important are not yet available.

Gamification of Training Motivation

Similar to approaches taken by those gamifying applicant reactions, the gamification of training motivation is intended to improve completion rates and trainee motivation to learn rather than to actually deliver instruction. Of all types of gamification, this is probably the best explored because of the simplicity of its deployment and the popularity of the approach among educators. Such efforts do not require the extreme resource investment of serious games. For example, Nicholson (2013) describes the gamification of a classroom by integrating game fiction (i.e., adding a story to course progress), leaderboards, and achievements into a classroom. These additions required no additional monetary expenses, although they did require somewhat more planning time.

Landers, Bauer, Callan, and Armstrong (2015) comprehensively reviewed psychological theories of motivation to identify which theories were most promising to describe the effects of gamifying training motivation. In doing so, they identified five major theoretical motivational frameworks that might ap-

Gamifying Recruitment, Selection, Training, and Performance Management

ply: the theory of gamified learning, classic learning theories, expectancy theory, goal-setting theory, and self-determination theory.

First, the authors identified the theory of gamified learning (Landers, 2014; Landers & Landers, 2014), the only psychological theory focusing upon gamified learning. This theory, targeted at gamification efforts where individual game elements are extracted and applied to support learning, proposes that game elements affect training outcomes through one or two mechanisms. First, gamification may be used to influence a mediating behavior or attitude, which is in turn theorized to affect learning. For example, in Landers and Landers' (2014) empirical test of this theory, a leaderboard was used to increase the amount of time learners spent engaging with a project, and that amount of time in turn increased learning outcomes. Second, gamification may be used to strengthen the relationship between instructional design and learning outcomes. For example, game fiction might be used to increase learner engagement, which should make existing course material more effective in increasing training outcomes. Critically, in both of these approaches, gamification is not intended to itself teach the learner anything; instead, it is used to support existing instructional material.

Second, the authors identified the classic learning theories of Skinner (1948) related to operant conditioning, where consequences are used to shape behavior. When a stimulus event occurs followed by a behavioral response, subsequent consequences will alter the frequency of the behavioral response in the future. When the consequences are desirable, they are referred to as rewards. When the consequences are undesirable, they are referred to as punishments. In the context of gamification, rewards are far more common than punishments. Often, recognition of accomplishments, such as using leaderboards, points, or badges, is used to reward target behaviors (Anderson, Huttenlocher, Kleinberg, & Leskovec, 2013; Denny, 2013; Fitz-Walter, Tjondronegoro, & Wyeth, 2011). Conditioning offers a powerful framework by which to influence behavior, but is limited to relatively narrow, very well-defined behaviors. When target behaviors are more complex, such as learning, conditioning brings many unintended negative consequences (Lee & Hammer, 2011).

Third, the authors identified Vroom's (1964) expectancy theory, which describes motivation as the mathematical product of expectancy (the belief that behavior will lead to an outcome), instrumentality (the belief that the outcome will lead to an event of value), and valence (the amount of value of that final event). Because Vroom's theory is multiplicative, it suggests that a near-zero value for any of these three components results in zero ultimate motivation. In the context of gamified learning, expectancy theory can be used to understand why some gamified rewards lead to greater behavioral change than others. For example, if scoring highly on a leaderboard is not a valuable accomplishment to a learner, its low valence is unlikely to trigger the learner to alter their behavior. Deloitte gamified an online executive training program by including rewards, rankings, and leaderboards to increase the valence of the training program (Badgeville, 2014). The executives' beliefs regarding the effectiveness and organizational benefits of the trainings did not change, but the reward value for completing these objectives did change, which motivated them to complete the training. Expectancy theory might work through other constructs as well. For example, if a trainee does not expect that playing a serious game will prepare him or her to perform workplace duties, low expectancy may cause the trainee to exert less effort in training.

Fourth, the authors identified Locke's (1968) goal-setting theory, which describes motivation as the iterative process of reducing the discrepancy between a person's goals and their actual behaviors, a process called self-regulation. When gamification is used to set goals for learners, the learners are motivated to reduce the discrepancy between the goals set for them and their actual behavior, although this varies among learners based upon their goal commitment. Goal-setting theory is one of the most powerful and

flexible motivational theories in modern industrial/organizational psychology, providing a great deal of predictive power in its description of which goals people will pursue and why. In general, specific, measurable, attainable, realistic, and time-bound (SMART) goals are the most effective at encouraging goal attainment (Doran, 1981). A variety of other mediators and moderators are also proposed in the context of goal-setting theory, which adds to its predictive power. In the context of gamification, goal-setting theory provides a great deal of guidance on what type of goals might be embedded within game-based learning to maximize learner motivation to achieve them. Such goals represent the element “rules/goals,” which is often at the core of games, describing the necessary conditions to “win” at a given game.

Fifth and finally, the authors identified Deci and Ryan’s (1985; 2000) self-determination theory, which characterizes motivation as driven by both intrinsic and extrinsic rewards. Intrinsic motivation is characterized by satisfaction of a person’s needs to be competent, autonomous, and to feel related to those around them. People feel driven to behave in ways that meet these needs. All other motivators are extrinsic in nature, caused by rational or emotional evaluation of desired outcomes and explicit decisions to pursue those outcomes. Typically, extrinsic rewards involve some of the processes involved in intrinsic motivation (external regulation, introjection, identification, and integration), but not all. Without intrinsic or extrinsic motivators, a person is said to be amotivated. Neither intrinsic motivation nor extrinsic motivation is necessarily stronger or “better” in any objective sense (Deci, Koestner & Ryan, 2001), and new evidence suggests that the two are complimentary (Cerasoli, Nicklin & Ford, 2014). Intrinsic motivation is considered by many to be the theoretical cornerstone of engaging people through games and gamification (Malone, 1981; Ryan, Rigby, & Przybylski, 2006; Przybylski, Rigby & Ryan, 2010; Aparicio, Gutiérrez Vela, González Sánchez, & Isla Montes, 2012; Gears & Braun, 2013), although gamification is often associated more strongly with extrinsic motivation.

Future Research

The gamification of training effectiveness and motivation is at a turning point. Serious games research has matured and is beginning to turn away from the case study approach toward an approach more consistent with modern social scientific methods (Bedwell et al., 2012). This shift is needed to improve the consistency of successes using serious games and should continue. Further investigations, however, must better explore which particular elements of games are linked to training outcomes of interest and why. By determining which elements of games are most closely tied to learning, those elements can be better extracted for application without the overhead of a complete serious game development process. For example, a training designer might randomly assign half of his or her trainees to experience game fiction in their training program and the other half to experience that training program in its original unmodified format. In this way, game fiction can be linked causally to differences in outcomes between the two groups in a way that is impossible with a correlational or case study design.

Future research on the gamification of training effectiveness might continue through popular training effectiveness models (e.g., Kirkpatrick, 1976), but ought to also consider models that consider the impact of technology explicitly (e.g., TETEM, Landers & Callan, 2012; Landers & Armstrong, in press). Such models should be tested with game-based training interventions and revised accordingly in order to best measure the effectiveness of game-thinking in training. While doing so, researchers should additionally consider the impact of game elements in a variety of learning contexts and based upon a variety of learning theories.

Future research on the gamification of training motivation might continue through any of the motivational theories described in this chapter. Research should specifically explore motivational theories of learning involving game-thinking (e.g., theory of gamified learning, Landers, 2014; Landers & Landers, 2014). Such models of gamified learning should be tested and revised in order to best measure the effects of game-thinking on training motivation. Recent advances in self-determination theory are particularly relevant, as the optimal balance between intrinsic motivators and external incentives has not yet been identified.

PERFORMANCE MANAGEMENT

Current Research

Job performance is determined by a number of factors including individual ability and motivation to perform. Effective performance management systems seek to maximize employee motivation toward the completion of organizational goals and objectives. Game-thinking provides a set of tools that can be utilized in order to enhance the motivational component of job performance, to bring employee behaviors more in alignment with the expectations of the organization. This can be accomplished through many of the same motivational theories impacting learning that were discussed in the training section of this chapter.

Gamification of Job Performance

The gamification of everyday job performance has the greatest potential for benefitting from game-thinking, as the variety of current existing jobs allows for an unfathomable number of gamified processes. The idea that everyday on-the-job tasks could be made fun and gamelike appeals to both employees and employers. Essential to the study of performance management is Campbell, McCloy, Oppler, & Sager's (1993) Job Performance model, which can be applied to gamify job performance. The model posits that declarative knowledge, procedural knowledge, and motivation are all antecedents of task performance, contextual performance, and adaptive performance. Each type of performance is a function of the interaction between the antecedents: declarative knowledge (i.e., an understanding of facts and requirements for the job), procedural knowledge and skill (i.e., the ability to apply declarative knowledge in the job context), and motivation. Because Campbell and colleagues' theory is multiplicative, it suggests that a near-zero value on any of these antecedents results in zero overall performance.

In order to capitalize on the motivational affordances of game-thinking, gamified performance management should focus on employee motivation. In Campbell and colleagues' (1993) theory, motivation consists of three multiplied components of choice: the choice to exert effort or not, the level of effort to exert, and the persistence of exerted effort. For example, an employee seeking to improve her organization's internal communication decides to enhance the communication software on all company computers by updating three computers per day. Thus, she has three choices via the components of motivation: the choice to exert effort toward improving internal communication, the choice of level of effort to put forth (updating software on three computers per day), and the choice of how long to persist in her efforts (until all computers have been updated). These three components provide her overall level of motivation to improve internal communication. Similar to the broader theory, the three components

of motivation are multiplicative, that is, a change in any of these decisions would result in a change to her overall motivation.

Game-thinking can be applied to motivate employees to exert effort, reach higher levels of effort, and continue their effort for longer amounts of time. In the previous example, the organization could increase employees' willingness to update computers by introducing a competitive points and rewards system. This system would motivate additional employees to work toward updating the computers, that is, those who enjoy competition (Bedwell et al., 2012), the prospect of a reward (Landers & Landers, 2014), or the social benefits of playing games (Koivisto & Hamari, 2014). The unpredictability and challenge of human competition could inspire some employees to update more computers at once or to spend more time working on the updates, thus increasing their level of effort, persistence of effort, or both.

Gamification of Motivation to Perform

Motivational theories provide direction as to how motivation might be altered in order to maximize job performance. The motivational theories described earlier in the gamification of training motivation section can be similarly applied in the gamification of motivation to perform. Specifically, expectancy theory, goal-setting theory, and self-determination theory provide the greatest potential value to increasing motivation to perform.

As discussed in the gamification of training motivation, expectancy theory describes motivation as the mathematical product of expectancy (the belief that behavior will lead to an outcome), instrumentality (the belief that the outcome will lead to an event of value), and valence (the amount of value of that final event). In the context of gamified performance, expectancy theory can be used to demonstrate how serious game behaviors will lead to desirable performance outcomes, how those outcomes will be rewarded, and how valuable those rewards are to the employee.

Each of the three components of expectancy theory already exists within a work environment; therefore at a minimum, gamified performance initiatives should increase at least one component while maintaining the other components. In a recent white paper, performance management consulting firm CallidusCloud (House, 2012) notes that cash prizes are not effective for changing employee behavior, and that run-off contests effectively increase performance only for the duration of the contest. Their solution was to offer a variety of short- and long-term challenges, goals, and contests covering a wide range of employee behaviors. To ensure employees were motivated to achieve these gamified work goals, CallidusCloud recommended providing gift cards or goods from leisure, retail, restaurants, and other local businesses. By offering a wide range of rewards, their gamified performance management system aims to motivate all employees, while taking into consideration their diverse range of desires and lifestyles.

Goal-setting theory states that goals help individuals direct their efforts, increase the persistence of those efforts, and act as a catalyst for strategic thinking (Locke, Shaw, Saari, & Latham, 1981; Locke & Latham, 2002). As mentioned earlier in the chapter, the SMART acronym is an easy way to remember the general conditions necessary for creating effective goals. When setting productivity goals for employees, it is important to ensure that goal attainment does not preclude other important organizational functions (Wright, George, Farnsworth, & McMahan, 1993).

Game-thinking often involves goal-setting, making the interaction between these two concepts a promising area for research and practice. For example, by assigning a range of point values to various work tasks, an organization may clarify each task's relative importance while maintaining a balance between the tasks employees choose to complete. Effective gamification can help create optimal condi-

Gamifying Recruitment, Selection, Training, and Performance Management

tions for goal-setting by outlining specific goals and providing quick, accurate feedback. When LiveOps, a customer service call-center, gamified the workplace, the company initiated a system of points and badges to reward the completion of important tasks (e.g., customer service objectives, optional training classes) and created a leaderboard designed to provide instantaneous feedback. As a result, LiveOps' sales performance increased by 10% and the average call time decreased by 15% (Bunchball, 2013). The LiveOps application of game-thinking to performance management created clear goals that were specific, measurable, attainable, realistic, and time-bound (i.e., SMART goals). In line with goal-setting theory and current gamification research, game-thinking intended to increase performance should have a pre-determined ending point to avoid extinction effects (Koivisto & Hamari, 2014). Serious performance games will be most effective when employees know exactly how and when the game will end, so they may plan their efforts accordingly.

Self-determination theory, which distinguishes intrinsic and extrinsic motivation (Gagné & Deci, 2005), also provides mechanisms for the success of game-thinking. In 2008, Pew Research Center reported that 53% of adults age 18 and older played video games (Lenhart, Jones, & Macgill, 2008). More recent data collected by the Entertainment Software Association (2014) indicate that 59% of Americans play video games, 71% of all gamers are over the age of 18, and 48% of gamers are female. Because many working-age Americans choose to play video games in their free time, gamified work tasks may be intrinsically motivating to a large portion of employees. Employees who are not intrinsically motivated by games may still reap performance benefits from extrinsic motivators inherent to games. These motivators include rewards for specific behavior, increases in self-esteem from goal completion, positive or negative performance feedback, and social pressures. Because a sense of autonomy is important to motivation (Deci & Ryan, 1985; 2000), employees desiring to continue performing their job without the inclusion of game elements should be allowed to do so without consequence. One reason for LiveOps' success in gamifying call-center performance was that the game was optional. This made the choice to play this game more meaningful (i.e., motivational) for the 80% of agents who played (Bunchball, 2013), while allowing the remaining employees to continue performing their tasks without losing autonomy or feeling coerced.

Future Research

Future research should focus on how real work performance can be gamified, making it more motivating to employees while still accomplishing workplace objectives. Different game elements and combinations of elements should be applied to different work tasks and contexts to determine where game-thinking can be incorporated. Next, these game elements should be manipulated to determine which elements are most effective at motivating job performance. Organizations will then be able to use this information to improve productivity via gamified performance.

Additionally, future research on game-thinking in performance management should focus on employee demographic information. These studies will yield insights into which industries, organizations, and employees are likely to benefit from the inclusion of game-thinking. In a study of a gamified exercise application, Koivisto and Hamari (2014) found a difference in perceived ease of using the application among different ages, such that older users found the application more difficult to use. This study also found a difference among genders, such that women valued the social aspects of gamification more so than men did. Further research is needed in assessing how game-thinking affects employees in different industries, education levels, socioeconomic status, etc.

Practitioners need to exercise caution when implementing game-thinking to performance management. Specifically, gamified solutions must directly reward and motivate the specific behaviors desired by management, while ensuring that the level of focus on these tasks does not impede completion of other important aspects of the job. Kerr (1995) described multiple examples of organizations rewarding the wrong behavior and thus receiving an undesirable outcome. Examples include an organization with the goal of long-term growth, but rewarding quarterly sales; a basketball team with the goal of teamwork, but rewarding the highest scoring player; and a manufacturer with the goal of creating a quality product, but rewarding faster shipping. Game objectives and rules should be carefully designed such that they will not deter from the work that is to be completed.

CONCLUSION

Through this review of research trends, several themes in the gamification of HRM arise. First, empirical research seems to be directed towards the question “Does gamification work?” (Hamari et al., 2014) rather than, “Why or how does gamification work?” These questions inquire as to the broad use of gamification more so than the specific use of it in HRM. Kappen & Nacke (2013) developed a comprehensive theoretical model of gamification effectiveness, which may be applied to the HRM contexts of training and performance management in assessing motivation. Models of game-thinking effectiveness still require further testing in order to determine the antecedents of motivating serious games and game elements. A second theme arising from this review is the focus on the gamification of learning/training, the gamification of performance management focusing on the field of sales, and the gamification of assessment for selection purposes. Given the literature on serious games in learning, game-thinking in employee training has a developed theoretical and empirical basis for support. The extraction and application of game elements to learning has begun and should continue to increase (see, e.g., Landers, 2014; Landers & Landers, 2014). The gamification of sales appears to be the most common form of gamification in a business setting. This is presumably because the most basic game mechanics (i.e. points, badges, and leaderboards) can be applied easily to a sales context without much thought or planning. It will take more imagination and creativity to gamify more complex areas of HRM such as selection, which is the newest burgeoning area of applying game-thinking in organizational contexts (Geimer & O’Shea, 2014; Kubisiak et al., 2014). A final theme recognized from this review is the ubiquity of points, leaderboards, and badges. They may be the easiest mechanics to apply initially, layering over almost any context, but do not necessarily improve metrics, engagement, or efficiency (Hamari, 2013; Montola, Nummenmaa, Lucero, Boberg, & Korhonen, 2009). However, recent evidence suggests that points, levels, and leaderboards do not harm intrinsic motivation, contrary to popular belief (Mekler, Brühlmann, Opwis, & Tuch, 2013).

Research on game-thinking should focus on the extraction and application of individual game elements and combinations of game elements in non-game contexts (e.g., Landers & Callan, 2011), specifically in organizational support settings such as HRM. Several frameworks and taxonomies of game elements have been developed (Malone, 1981; Hunnicke, LeBlanc, & Zubek, 2004; King, Delfabbro, & Griffiths, 2010; Bedwell et al., 2012; Robinson & Bellotti, 2013) and used in gamified contexts (Geimer & O’Shea, 2014; Landers, 2014; Landers & Landers, 2014). Game elements include the likes of conflict/challenge, level of user control, game fiction/fantasy, and human interaction among others. The extraction of game elements to gamify non-game processes in HRM is where research can progress

Gamifying Recruitment, Selection, Training, and Performance Management

most efficiently. The overhead associated with digital serious game development naturally limits the speed of research progress in this area due to limited research resources, but modern gamification is less limited. Game elements can be adopted at little or zero cost for rigorous empirical testing. Once specific elements are identified and validated as effective tools, researchers and practitioners alike will better understand why game elements are effective and how they can be applied to recruit, assess, and engage employees. Future research of game-thinking within each major area of HRM is necessary for the successful progression of its application. Within recruitment, research should explore how serious games and game elements affect organizational attractiveness. Within selection, future research should focus on the validation and fairness of serious games and game-like assessments. Additionally, research should explore the use of game elements to improve applicant reactions. Future research in the gamification of training should test game-thinking within the context of training effectiveness models and models of motivation. Finally, in the context of performance management, research should explore how different types of work and performance can be gamified, considering demographic differences that may impact gamified performance outcomes.

In applying game-thinking to HRM, several limitations must be considered. Unrealistic expectations of serious workplace games may prevent effective applications from being adopted. When digital serious games are adopted, they may adversely affect different demographics within the workplace. For example, Koivisto & Hamari (2014) noted an effect of age on perceived ease of use of a digital gamified exercise service such that as age increased, perceived ease of using the system decreased. Furthermore, games may demonstrate gender differences (Jansz & Tanis, 2007). Future research should investigate how individual demographic differences affect the relationship between game-thinking and learning or performance outcomes. Further, game-thinking may mislead potential job applicants. Highly enjoyable games may be excellent tools at attracting applicants, but do not guarantee that the applicants will remain in their position or with the organization for very long. Thought should be given in planning gamified recruitment efforts such that game-thinking does not mislead potential applicants. However, even if game-thinking is applied truthfully, applicant perceptions can still lead to potential litigation against the organization. Applicants perceiving serious selection games or game-like assessments as unfair or irrelevant to the job may complain when they are not selected for a job. Game-thinking in selection should ensure that assessments are reliable, valid, and fair. In training, poor trainee attitudes and lack of previous experience with games might hinder their receptivity to game-based training (Landers & Armstrong, in press).

As in any research context, sound theoretical models and methodology should be employed. Empirical research should be the basis for theory, as theory should be the basis for future research. Quantitative experimental methods should be used whenever possible, as they are objective and more easily replicable than qualitative and subjective measures. A focus on quantitative, experimental data will enable compilations of the average effects of gamification in HRM in the future (i.e. meta-analyses).

Overall, the future of gamification in HRM looks both bright and bleak. Although industries applying serious games and game elements to their HRM practices may reject game-thinking due to the failed application of mechanics such as points, leaderboards, and badges, research interest in game-thinking is quickly accelerating. The breadth of questions remaining to answer is vast. The definition of a game or even the definition of “fun,” is a complex concept to grasp, debated among scholars for several decades (Jesper, 2003). After agreeing upon definitions and taxonomies of game elements, game types, player types, and more, the field of applied game-thinking still needs to determine how to best combine these characteristics in order to achieve specific objectives in the realm of HRM. Applied game-thinking and research in HRM has seen some success thus far, but its true potential might not yet be realized.

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KEY WORDS AND DEFINITIONS

Gamification: The use of game elements in non-game contexts.

Performance Management: A continuous process of identifying, measuring, and developing the performance of individuals and teams and aligning performance with the strategic goals of the organization.

Recruitment: Organizational activities that influence the number and/or types of applicants who apply for a position and/or affect whether a job offer is accepted.

Selection: The administration of psychological assessments to job applicants in order to predict later job performance from assessment scores and thus aid in hiring decisions.

Serious Game: Games used for a primary goal other than entertainment.

Training: Activities leading to the acquisition of knowledge, skills, and attitudes relevant to an immediate or upcoming job or role.