Examining Game-based Approaches in Human Resources Recruitment and Selection: A Literature Review and Research Agenda

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Abstract

Human resources departments have embraced the use of technology to incorporate game-based approaches (GBA) to encourage potential applicants to apply for open positions and to select employees among qualified candidates. We examine the academic literature on the use of serious games, game-inspired design, game-like simulations, gamification, and other GBA used to support recruitment and selection activities. Based on our review of 35 articles, we describe the state of research related to GBA for recruitment and selection, including theoretical foundations, targeted outcomes, and game design elements examined or discussed within this literature. Based on our systematic review of the literature, we identify opportunities for future research related to GBA in recruitment and selection of employees.

1. Introduction

Organizations compete in the "war for talent" [40, 62] and increasingly rely on information technology to encourage the right people to apply for open positions (i.e., recruitment) and to identify which individuals have the needed skills for the position (i.e., selection). Traditional recruitment and selection methods, such as job postings, interviews, self-report questionnaires, and cognitive tests, are being augmented or replaced with technology-driven solutions [62]. One emerging technological trend in HR is the use of game-based approaches (GBA) to enhance the recruitment and selection process [37]. GBA include, but are not limited to, serious games, gamification, game-inspired designs, and simulations. Organizations use GBA to increase their attractiveness as an organization [20], to improve their applicant pool [12], and to identify applicants and employees with needed digital competencies [48]. For applicants, GBA informs individuals about potential careers [32] and offers a means to assess skills for a position in an engaging way [33].

Some organizations have created branded games to attract candidates to apply for open positions (e.g., United States Army, Marriott Hotels) [28]. Other organizations use competitive business simulation games to identify talent [e.g., 6] or adapt existing assessment methods with game-like affordances to improve applicant engagement [19]. Enabled by technology, a nascent industry is emerging to provide organizations with game-like assessment capabilities (e.g., Arctic Shores, KnackApp, pymetrics) [23].

For decades, practitioners have used GBA for HR recruitment and selection. However, the academic literature has not kept pace with the rapid changes occurring in practice. To assess the state of research, we conducted a systematic review of GBA in the academic literature related to HR recruitment and selection. Our research objectives are: (1) to examine the current state of GBA research in HR recruitment and selection, and (2) to develop an agenda for future research.

2. Background

2.1. Game-based approaches

GBA are inclusive of finer-grained concepts such as gamification and serious games. *Gamification* is broadly defined as the incorporation of *game design elements* into non-game contexts [14]. A non-game context can refer to any context that involves activities not typically associated with games such as education, healthcare, marketing, and HR management. Game design elements are the building blocks of games, including characteristics such as points, badges, rewards, leaderboards, and narratives to promote psychological or behavioral reactions in the user. By comparison, *serious games* are full-fledged games designed with an instrumental purpose [39]. Whereas serious games can embody instrumental goals without disrupting a target activity, gamification requires restructuring aspects of a target activity to make it more engaging [13]. Such distinctions among GBA are still developing in this emerging domain [52], and further conceptual clarity and differentiation are needed to advance the state of knowledge [27, 51].

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2.2. Human resources

HR departments are responsible for activities that span the lifecycle of an employee's involvement with an organization. HR is often responsible for posting job advertisements, encouraging potential applicants to apply, screening and interviewing applicants, and working with the hiring manager to select the applicant with the best fit for the organization. After hiring an employee, HR provides orientation, training, and other onboarding activities. Furthermore, HR coordinates benefits, encourages employee retention, supports the performance evaluation process, and oversees the exiting process for retired or terminated employees.

In the recruitment process, HR departments seek to generate a talent pool of highly qualified applicants that have a potential fit with the organization. Many HR departments nowadays apply GBA in their recruitment process. Some organizations use GBA to help applicants visualize themselves as a member of the organization [23]. Other organizations use GBA to improve candidate engagement during the job search process to heighten the applicant's commitment to the organization [41]. Scholars have suggested that GBA create a more diverse and more engaged talent pool [41] as compared with traditional means such as job advertisements.

In the selection process, HR departments screen resumes or applications to identify which applicants fit the needs of an open position. After narrowing the applicant pool, organizations use interviews and/or psychometric testing to select among the candidates. Psychometric testing can measure a candidate's quantitative and verbal skills, logical reasoning ability, and personality traits, among other attributes. Some forms of psychometric testing ask applicants to apply their knowledge to scenarios or role play. Increasingly, organizations apply GBA to psychometric testing to reduce testing anxiety [12] or to create a sense of fun or challenge [16] in the selection process. In other cases, organizations use GBA to capture psychometric and behavioral measures through direct observation of applicant actions. In tandem with enabling direct observation (rather than self-reporting) of applicant behavior, GBA help to create an environment in which it is more difficult to falsify information or misrepresent oneself to "game the system" in pursuit of a job [4].

Although HR performs additional activities beyond recruitment and selection, we focus on these activities for three reasons. First, the HR recruitment and selection processes are externally facing (i.e., non-employees), and the application of GBA to these processes is quite different from GBA applications of HR processes for current employees. Second, the processes of recruitment and selection are the first interactions that most applicants have with an organization. Positive experiences during recruitment and selection can set the tone for future engagement with the organization as an employee [42]. Third, given the expense required to attract qualified candidates, select the best candidates, and train new employees, organizations want to hire the right people for a position [40].

3. Methodology

3.1. Identifying and selecting articles

We identified articles examining the role of GBA (gamification and serious games) in the context of HR by performing searches in Scopus and Business Source Complete. Scopus offers a broad range of journals and has been used for other literature reviews on gamification [e.g., 21, 30]. Due to the business-oriented nature of the topic, we also searched for articles within Business Source Complete.

We used broad search terms related to GBA in addition to terms related to HR activities, such as recruitment and selection to identify articles for this literature review. The portion of the search query for topics was ("gami*" OR "serious gam*") AND (recruit* OR hiring* OR hire* OR select* OR assess* OR retent* OR retain* OR talent* OR "human res*"). Given the large number of search terms and the focus on GBA, we limited our search to English language articles, published in journals, but we did not restrict articles based on publication year. Within Business Source Complete, we restricted our search to peer-reviewed journal articles (consistent with [55]). For Scopus, to focus the search on the domain of HR, we limited articles to journals classified in the subject area of business or computing to identify articles focused on GBA targeting HR management topics. This initial search of Scopus and Business Source Complete resulted in 2,142 articles (Step 1).

Duplicate articles (Step 2) and articles outside of the scope of this study (Step 3) were removed. Some of the articles removed in Step 3 focused on casino gaming (203 articles), education and training (856 articles), or other unrelated phenomena such as gaming addiction, economics experiments (e.g., game theory), or games for other purposes beyond recruitment and selection.

In Step 4, the references for the remaining articles were examined for potential journal articles or book chapters to include (i.e., backwards search). For these articles, a forward citation search was also performed to include recently published journal articles and book chapters. Any new article identified in this process also was subjected to a reference list search and forward citation search until no new articles were identified.

In Step 5, two co-authors not involved in the initial screening process reviewed the remaining articles for

potential inclusion in the literature review. Initial interrater agreement was low (Cohen's kappa of 0.326). Articles for which there was agreement by the two co-authors to remove the articles were dropped, leaving 55 potentially relevant articles in the list. In a final review (Step 6), all co-authors reviewed each article for the following criteria: (a) the article was in the context of recruitment and/or selection (or activities that are part of these processes) and (b) the article discusses the application or use of GBA with information technology. After discussion of each of the articles, we reached full agreement on the final 35 articles to include in the literature review. Table 1 summarizes the number of articles remaining after completing each step of the literature review process.

Table 1. Literature review process

Step	Description	Articles remaining
1	Initial database search	2,142
2	Check for duplicates	1,888
3	Additional screening of full article	51
4	Examine references and forward citation search	69
5	Full screening of article	55
6	Finalizing criteria	35

3.2. Data analysis

We coded and analyzed the final set of 35 articles using a concept-centric approach [60]. We classified each article into descriptive categories based on the methodology, article focus (i.e., organizational versus applicant), type of HR process, type of GBA considered, definitions of GBA terms, and demographics of interest. To determine the type of GBA, we read each article to identify whether the article discussed GBA,[1] serious games, or gamification. The appendix provides the descriptive attributes of each article.

We also examined the theoretical lenses used and the extent to which theory was applied in each article. Some articles briefly mentioned theory, while others applied theory more thoughtfully. We coded the game design elements discussed or used in each article, noting that some articles "mentioned" game design elements nominally while others "used" game design elements more extensively. For empirical articles, we identified the targeted outcomes for the research study.

We independently coded each of the above categories and our interrater reliability for each concept was 0.610 or higher. As co-authors, we discussed all

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[1] We classify an article as GBA if it discusses multiple related concepts (e.g., both serious games and gamification).

discrepancies and reconciled differences to reach 100% agreement for each category.

4. Results

4.1. Descriptive categories

Of the 35 articles, 13 articles (37%) are literature reviews, 7 articles (20%) are conceptual, and 15 articles (43%) are empirical. Among the empirical articles, 4 use qualitative methods, 2 use descriptive analysis, and 9 use quantitative methods to test hypotheses. No articles used multiple methods to test hypotheses.

We identified the focus of each article as to whether the article considered GBA for recruitment or selection from the organization's or the applicant's perspective. Empirical articles are balanced in that 8 articles focus on organizations, and 7 articles focus on applicants. However, of the non-empirical articles (conceptual or literature reviews), 18 of the 20 articles consider the organizational perspective.

Among the articles, 9 articles (26%) consider GBA for recruitment, 13 articles (37%) consider GBA in the selection process, and 13 articles (37%) discuss GBA for recruitment and selection. The literature is more focused on gamification (22 articles, 63%) than serious games (4 articles, 11%) overall, with the remaining (9 articles, 26%) discussing GBA more broadly.

Of the 35 reviewed articles, 29 articles define gamification, (Table 6 in the appendix). Of these, 23 (79%) define gamification consistently with Deterding et al. [14] as the use of game design elements in a non-game context. Of 13 articles defining serious games, 6 cite Michael and Chen [39], and other definitions are generally consistent with this definition. Multiple articles position serious games as interchangeable with gamification [e.g., 6, 62] or as a subset or superset of gamification [e.g., 17]. As a broader concept, the game-thinking term, which we consider to be synonymous with GBA, appears in 3 articles. We also note the recurring concept of "gamified assessment" in 5 articles, a specific use case of gamification that is common to selection within the HR context.

Of the 15 empirical articles, 12 articles report that younger people (generations Y and Z) are the targeted demographic for their research related to GBA for recruitment and selection. Three of the reviewed articles noted that targeting a specific demographic can result in age-based discrimination, one potential dark side of GBA for recruitment and selection.

4.2. Theoretical lens

Most of the current academic research on GBA related to HR recruitment and selection is atheoretical, with more than half of reviewed articles containing no substantive mention of theory. About half of the empirical articles consider theory, while the remaining articles do not rely on theory as they describe GBA within HR selection and recruitment. Conceptual articles give more attention to theory, while literature reviews either merely mention or (more often) ignore theory altogether. The role of theory is more pronounced in applicant-focused articles in that 7 of 9 empirical articles used theory. Fewer organization-focused articles discuss theory; 17 of the 26 articles contain no theory, and only 3 articles incorporate theory more fully. These findings suggest that empirical research with an organizational perspective is less informed by theory. Table 6 (appendix) presents the relevant details.

Table 2 identifies the theories discussed within the reviewed articles, distinguishing between those that were "used" versus those that were merely "mentioned."

Table 2. Identified theories

Article Type	Theories Used
Conceptual:	Actor Network [53]; Affective Events [32]; Rites of Passage [56]
Lit. Review:	None
Empirical:	Applicant Reactions [12]; Gamification [33]; Organizational Citizenship Behavior [44]; Organizational Justice [18, 34]; Self-determination [6]; Signaling [19, 20]; Technology Acceptance [6, 34]

Article Type	Theories Mentioned
Conceptual:	Expectancy [8]; Goal-setting [4] ; Operant Conditioning [8]; Person-environment Fit [58]
Lit. Review:	Affordances [11]; Applicant Reactions [43]; Attraction-Selection-Attrition [4]; Brand Equity[11]; Flow [16]; Goal-setting [16]; Invasion of Privacy [43]; Need Satisfaction [16] ; Operant Conditioning [16]; Organizational Justice [4, 43], Person-environment Fit [4, 11]; Self-determination [11]; Social Validity [43]; Test-taking Motivation [43]
Empirical:	None

No theory dominates this context, with 10 different established theories "used" across 13 articles. Only 3 theories are used in more than one article: organizational justice, signaling, and technology acceptance. We also note a misalignment between the "mentioned" theories in non-empirical articles and those "used" in empirical articles. Of 15 theories mentioned in non-empirical articles, only 3 theories were examined in empirical articles: applicant reactions, organizational justice, and self-determination.

4.3. Targeted outcomes

We identified the targeted outcome(s) of GBA for recruitment and selection within each empirical article, resulting in 42 distinct outcomes among the 15 articles. We classified each targeted outcome into five outcome categories identified by Hassan and Hamari [22]. In our coding, we realized two additional categories were needed for our context: organizational and measurement outcomes. Organizational outcomes represent benefits to the organization of using GBA for recruitment and selection. Given the importance of fairness in HR assessments, measurement outcomes represent the validity or similarity of psychometric assessments when GBA are used compared to traditional assessment methods.

Table 3. Targeted outcomes

Category	Targeted Outcomes
Behavioral:	GPA Prediction, Job Performance, Intention to Recommend, Intention to Use
Emotional:	Anxiety, Entertainment, Perceived Attractiveness, Preferred Game Form, Satisfaction
Cognitive:	Accountability, Adaptability, Business Acumen, Conceptual Thinking, Decisiveness, Digital Literacy, Innovation, Job Awareness, Organizing and Planning, Problem-Solving, Risk Taking
Measurement:	Situational Judgment Test, Soft Skills
Motivational:	Attitude towards Test, Drive, Engagement, Motivation, Openness to Learning, Results Orientation
Organizational:	Applicant Pool, Employer Branding, Expense, HR Efficiency, Knowledge, Perceived Technological Sophistication, Use Level
Social:	Collaboration, Awareness of Others, Communication, Influencing Others, Perceived Test Fairness, Global Mindset, Organizational Citizenship

Most of the studies measure outcomes based on applicants' perceptions. Only 5 of the 15 empirical articles measure the actual skill or competency level of a potential applicant.

The proposed relationships with targeted outcomes within the empirical articles are fully supported for articles with behavioral (5 of 5) and cognitive (2 of 2) outcomes. However, none of the articles examining a relationship between an antecedent and social (0 of 6) or organizational (0 of 1) outcome find full support. Among the empirical articles, few articles examining relationships between an antecedent and motivational (1 of 3) or emotional (2 of 5) targeted outcomes find full support. Only one empirical article examining a measurement outcome, in which the authors assess the validity and reliability of a measure of competencies using GBA, finds full support (1 of 3).

4.4. Identified game elements

In reviewing the articles, we identified 55 distinct game design elements. We categorize these elements based on the affordance commonly associated with each, acknowledging that any design element may offer different affordances depending on the context. Table 4 presents the game design elements by category, and the frequency of each category.

Individual achievement (challenge – self) dominates the game design elements mentioned. This finding is similar to other gamification literature reviews that highlight the prevalence of points and badges. Furthermore, given that recruitment and selection seek to identify individuals for positions within the organization based on their personal traits and abilities, the focus on individual achievement is consistent with the context. Achievement in relation to others (challenge – other) is also prevalent (fourth most mentions), with leaderboards being common as the third component of the classic "points, badges, leaderboards" (PBL) gamification trifecta. Other commonly occurring categories are immersion (29), contingency (22), and choice (18), highlighting the importance of creating a game-like environment like those traditionally associated with hedonic enjoyment. Relatively fewer articles mentioned elements based on social interaction (12) and self-presentation (10).

Table 6, in the appendix, presents the extent to which game design elements play a role in the reviewed articles. Empirical articles are roughly split between a more thorough treatment of design elements (5), nominal discussion (6), or non-focus on specific elements (4). Conceptual articles tend to focus more on the design elements in the gamification artifact (6 of 7), while literature reviews tend to treat design elements more nominally (9 of 13).

Table 4. Game design elements

Category	Elements	N
Self-presentation:	Avatars, Profile	10
Social / interaction:	Cooperation, Gifting, Interaction, Relationships, Social chart, Social connection, Teamwork, Transactions	12
Challenge – self:	Achievement, Badges, Challenge, Collection, Error analysis, Feedback, Goals, Levels, Missions, Points, Problem solving, Progress, Resource allocation, Rewards, Time pressure, Tips	97
Challenge – other:	Combat, Competition, Conflict, Leaderboards, Ranking, Winning	28
Immersion / engagement:	Emotions, Fantasy, Graphics, Immersion, Interactivity, Sensory stimuli, Sound, Virtual environment	29
Choice:	Branching, Control, Freedom of action, Navigation, Repetition, Role play, Virtual goods, Voting	18
Contingency:	Chance, Mystery, Narrative, Rules, Suspense, Uncertainty, Unlock content	22

5. Discussion and research agenda

Based on our review of this literature, we identify trends and propose directions for future research along the following themes: consideration of context, clarification of concepts, and treatment of theory.

5.1. Consideration of context

Researchers interested in HR applications of GBA should consider the elements of HR practice and research that may affect the application of GBA in the recruitment and selection of employees. Recruitment and selection processes are unique from many other applications of GBA in organizational settings in that most countries have legal requirements to ensure fairness in the recruitment and selection process. Alternative approaches for designing, developing, and assessing GBA in recruitment and selection are needed to ensure the inclusion of GBA does not interfere with legal regulations or diversity initiatives. In an HR context, considering intersectionality (racial and ethnic identity, age, sexual orientation, ability/disability, class status, religion, veteran status and cognitive diversity) and game elements will ensure that the design attracts diverse candidates and does not discriminate or deter protected classes in the recruitment and selection

processes. Currently, most research examining GBA in an HR recruitment and selection context focuses on appealing to younger workers. Within our literature review, we found little research examining if the measurement validity of psychometric testing, often used in the HR selection process, changes when using GBA [19, 44, 54]. If certain demographics respond differently to psychometric assessments that are offered using traditional (i.e., paper or computer-based) assessments versus GBA, then there will be a need to examine if GBA increases or decreases the potential for discrimination among protected groups. Opportunities abound to examine how GBA in recruitment and selection impacts groups or demographics, based on age, race, national origin, gender, or other protected classes. Such work can inform research on GBA and protected groups more broadly.

The empirical studies conducted in this context find less support for emotional, measurement, motivational, organizational, and social outcomes, and find strong support for behavioral and cognitive outcomes. Thus, the effectiveness of GBA interventions in the HR context, as compared to non-GBA alternatives, remains an open question. Consistent with research on GBA in other contexts (e.g., civic engagement) [22], we also note the need for additional research to explore the effects of GBA interventions and whether investments in these interventions are profitable for organizations. Future research should apply more rigorous multi-method approaches to investigate the outcomes of GBA in organizational contexts.

GBA research in recruitment and selection is consistent with the larger body of GBA literature in its emphasis on PBL; however, some research in this domain acknowledges the importance of creating environments that offer immersion, discovery, and choice. Fewer articles mention self-presentation and social interaction. In a context so focused on assessing individuals, self-presentation may be an understudied phenomenon with GBA in HR and other work contexts. Although individuals tend to be the focus of recruitment and selection, incorporating social interaction in GBA may help organizations identify employees who can work effectively in teams. Examining the role of GBA in supporting and enhancing self-presentation and social interaction is worthy of deeper study.

5.2. Clarification of concepts

Consistent with the broader GBA literature, we note that several of the reviewed articles conflate the concepts of gamification and serious games. This may relate to the prominent use of the broadest definition of gamification (i.e., the use of game design elements in a non-game context; [14]). While this definition is appealingly simple and generalizable, it lacks specificity [35] and creates ambiguity in defining a "non-game" context [25]. This definition makes gamification indistinguishable from a serious game if one considers a game simply as a combination of game design elements. Games are separable from ordinary life [24], whereas gamification exists in day-to-day processes. The instrumentality of serious games inheres in the experience of gameplay [39], such as by using a serious game for recruitment to increase organizational attractiveness. Gamification, by comparison seeks to affix game-like experiences to existing instrumental tasks [35], such as by adding game elements to a personality assessment to reduce testing anxiety. A few articles refer to the umbrella term of game-thinking, and several use but do not define relevant terms.

This conceptual ambiguity threatens to hinder future research in HR and beyond, as such key concepts in a domain provide critical kernels for theory construction [27]. While we believe the HR literature's current focus on the practical application of gamification and serious games for recruitment and selection is fruitful, future research should strive to more clearly identify the focal phenomenon and consider its nature in theory and study design. We recommend the use of refined definitions and frameworks for gamification in the HR recruitment and selection process. For example, Huotari and Hamari [25] define gamification as enhancing a service with game-like affordances to enhance overall value creation. This definition addresses the goal of gamification (i.e., enhancing value creation) and the presence of some related system or service (i.e., existing irrespective of any game-like affordances) without assuming a potentially ambiguous "non-game" context. Similarly, Liu et al. [35] offer a more detailed framework for gamification research that can undergird theories of gamification design and use.

We also note a need to clarify concepts relating to the artifact in GBA, specifically around game design elements. While conceptual articles related to HR GBA have a strong focus on design via game elements, empirical work lacks this focus. These articles investigate the effects of game elements on targeted outcomes including intention to recommend, motivation, anxiety, and perceptions of attractiveness and fairness. Future empirical work should be sensitive to the artifact in GBA and should consider aspects of the design that align with desired outcomes (e.g., individual achievement, teamwork, self-presentation) while maintaining a gameful experience via immersion, contingency, and choice. Such work can help reconcile the mixed results observed between outcome categories.

5.3. Treatment of theory

Although nearly half of the articles reviewed are atheoretical, where theory is mentioned or used, we note a good balance of native HR and management theories (e.g., applicant reactions, person-environment fit) with external theories common to the GBA context (e.g., goal-setting, self-determination). The early atheoretical nature of research in this area is consistent with other reviews of GBA research [30, 52], but emergent theories in the broader context show promise [33, 35]. As with any emerging discipline, we acknowledge the natural progression from description and exploration to theory development. We encourage future research to actively engage in theory development and evaluation.

More specifically in HR recruitment and selection, we note a disconnect between the theories employed in empirical articles and those discussed in non-empirical articles. Of the 22 identified theories in our review, only three theories mentioned in non-empirical articles are used in empirical articles. There are 12 theories mentioned in non-empirical articles that have yet to be examined in the context of HR recruitment and selection, offering opportunities for future research.

Despite most articles focusing on the organizational perspective in studying GBA in recruitment and selection, the theories used are primarily at the individual level (e.g., self-determination, technology acceptance). While some of the employed theories are multi-level (e.g., actor network theory, gamification theory) or incorporate an organizational referent (e.g., organizational citizenship behavior, organizational justice), we suggest that future studies can benefit by adopting theoretical lenses that are congruent with the focal phenomena. For example, sociotechnical systems theory can help to explain the co-evolution of human and technical systems as organizations adapt to dynamic cultural and regulatory contexts [50, 59]. Theories of team coordination and communication [e.g., 38] can help to explain and predict applicants' teamwork skills and GBA can serve to assess or even enhance such skills. At a higher level, human-centric theories of the firm may help to guide strategic use of GBA in organizations as the war for talent continues. Table 5 presents a summary of the proposed research agenda.

6. Conclusion

Our goal was to examine the current state of research on GBA in the context of HR with a focus on recruitment and selection, and to develop a research agenda to support future inquiry in this domain. We reviewed 35 articles that study GBA in HR recruitment and selection. This new way of attracting and selecting talent offers advantages for practice.

While our findings align in some ways with prior literature reviews (e.g., nascent use of theory, prevalence of PBL, frequent mixed results), they also reveal context-specific areas of misalignment (e.g., proposed vs. used theories, design focus in conceptual but not empirical articles).

Considering the limited empirical research conducted on GBA in recruitment and selection, this area is ripe with opportunities to apply fresh theoretical perspectives, conduct rigorous empirical studies, and explore new ways to attract and optimize talent. GBA can contribute to finding diverse and high-quality applicants, and to helping organizations and individuals find the right fit.

Table 5. Research agenda

Issues	Recommendations
Consideration of context	
• Legal issues in HR • Effect of GBA on employee diversity • Prevalence of mixed results related to outcomes of GBA • Limited study of game elements	• Study how GBA attract or deter protected groups in HR and other contexts • Use multiple methods to assess effectiveness of GBA vs. non-GBA approaches • Study game elements that assess self-presentation and social interaction as desirable candidate abilities
Clarification of concepts	
• Lack of clarity for core concepts • Misalignment between conceptual and empirical focus on game elements	• Build on more refined definitions and frameworks to study GBA • Increase design focus in empirical research to align artifacts with desired outcomes
Treatment of theory	
• Current state is mostly atheoretical • Suggested theories are not used in empirical research • Primary focus on individual-level theories	• Build on current theorizing from the broader GBA literature • Employ promising theories from HR literature • Align theoretical lens with focal HR phenomenon

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8. Appendix

Table 6. Descriptive classifications by article

Article	Methodological Approach	Perspective	Game-based Approach	Gamification Source	Serious games Source	Demographics	Theory Application	Game Element Application	HR Processes
[1] Allal-Chérif (2014)	E	O	SG	None	Own	Y/Z	None	M	R
[2] Allal-Chérif & Makhlouf (2016)	L	O	SG	None	Own	Y	None	None	R, S
[3] Allen (2014)	E	O	SG	None	None	Z	None	None	R
[4] Armstrong et al. (2015)	L	O	GBA	[14]	[39]	None	M	M	R, S
[5] Armstrong et al. (2016)	C	O	GF	[14]	[39]	None	M	M	S
[6] Buil et al. (2020)	E	A	GBA	[29]	[61]	Y	U	M	R
[8] Callan et al. (2015)	C	O	GF	[14]	None	None	M	U	R
[9] Chamorro-Premuzic et al. (2016)	L	O	GF	None	None	None	None	M	S
[10] Chamorro-Premuzic et al. (2017)	L	O	GF	[14]	None	None	None	None	S
[11] Collmus et al. (2016)	L	O	GBA	[14]	[39]	None	M	M	R, S
[12] Collmus & Landers (2019)	E	A	GF	[14]	None	None	U	U	S
[16] Ferrell et al. (2015)	L	O	GF	[15]	None	None	M	U	R, S
[17] Fetzer et al. (2017)	C	O	GBA	Own	Own	None	None	U	S
[18] Georgiou et al. (2019)	E	O	GF	Own	[39]	Y	None	U	S
[19] Georgiou & Nikolaou (2020)	E	A	GF	[14]	None	Y	U	U	S
[20] Gkorezis et al. (2020)	E	A	GF	[14]	[39]	Y	U	U	R, S
[23] Hawkes et al. (2018)	L	O	GBA	Own	[49]	None	None	U	R, S
[26] Ihsan & Furnham (2018)	L	O	GF	[14]	None	None	None	M	R, S
[31] Krasulak (2015)	E	A	GF	[14]	None	Y	None	M	R, S
[32] Küpper et al. (In Press)	C	O	GBA	[14]	Own	None	U	U	R, S
[33] Landers et al. (2020)	E	A	GF	[14]	None	None	U	U	S
[34] Laumer et al. (2012)	E	A	SG	None	[47]	Y	U	M	R
[36] Lowman (2016)	L	O	GF	[14]	None	None	None	M	R, S
[41] Nair & Sadasivan (2019)	E	O	GF	[7]	None	Z	None	M	R
[43] Nikolaou et al. (2019a)	E	O	GF	[14]	None	Y	U	None	S
[44] Nikolaou et al. (2019b)	L	A	GF	[14]	None	None	M	M	R, S
[45] Obaid et al. (2020)	L	O	GBA	[14]	None	None	None	M	R
[48] Petter et al. (2018)	E	O	GBA	[7]	None	Y	None	None	R, S
[53] Shree & Singh (2019)	C	O	GF	[14]	None	None	U	U	R
[54] Simons et al. (2020)	E	O	GBA	[14]	[39]	None	None	None	S
[56] Tansley et al. (2016)	C	A	GF	Own	None	None	U	U	S
[57] Tippins (2015)	L	O	GF	[46]	None	None	None	M	S
[58] Tosca et al. (2019)	C	O	GF	None	None	None	M	U	R, S
[62] Woods et al. (2020)	L	O	GF	[14]	None	None	None	M	S
[63] Woźniak (2015)	E	O	GF	[14]	None	Y/Z	None	M	R, S

Methodological Approach: Conceptual (C), Empirical (E), Literature Review (L)
Perspective: Applicant (A), Organization (O)
Game-based Approach: General (GBA), Gamification (GF), Serious Games (SG)
Demographics: Generation Y (Y), Generation Z (Z)
Theory Application and Game Element Application: Mentioned (M), Used (U)
HR Processes: Recruitment (R), Selection (S)

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