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To Study the Influence of Virtual Reality (VR) and Emerging Technologies on Onboarding and Employee Engagement

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Abstract
Organisations are increasingly digitalising human resource management and experimenting with immersive and data-driven tools to improve employee experiences across the employment lifecycle (Strohmeier, 2007; Stone et al., 2015). Among these tools, virtual reality (VR) and adjacent emerging technologies such as augmented reality (AR), gamified onboarding platforms, and conversational agents are positioned to reshape newcomer learning and socialisation by enhancing experiential realism, interactivity, and accessibility (Bacca et al., 2014; Følstad & Brandtzæg, 2017; Slater, 2009). Despite growing interest, research has not yet converged on a clear explanatory account of how technology-enabled onboarding translates into sustained employee engagement, and under what conditions such effects are likely to emerge (Kahn, 1990; Saks, 2006). This paper develops an integrative framework linking VR and emerging onboarding technologies to employee engagement through key onboarding outcomes, including role clarity, perceived organisational support, and self-efficacy (Bandura, 1977; Eisenberger et al., 1986; Rizzo et al., 1970). Drawing on organisational socialisation theory and media-based perspectives on presence and social interaction, the paper proposes testable hypotheses and outlines a time-lagged survey design suitable for structural equation modelling. The study contributes by clarifying mechanisms and boundary conditions, while offering evidence-informed guidance for HR leaders seeking to design ethical, effective, and inclusive technology-enabled onboarding systems (Bondarouk & Ruël, 2009; Marler & Boudreau, 2017).
Keywords*: virtual reality, emerging technologies, onboarding, organisational socialisation, employee engagement, e-HRM*

I. Introduction

Employee onboarding is a strategically consequential organisational process through which newcomers acquire role-relevant knowledge, build social connections, and internalise organisational norms and values (Van Maanen & Schein, 1979; Wanberg, 2012). A substantial body of research indicates that the quality of newcomer adjustment predicts outcomes including job satisfaction, commitment, performance, and turnover intentions (Bauer et al., 2007; Chao et al., 1994). In parallel, employee engagement has emerged as a central construct in organisational behaviour and HRM because it captures a persistent, work-related state of energetic involvement that correlates with individual and unit-level performance outcomes (Harter et al., 2002; Schaufeli et al., 2002). Scholars have therefore increasingly examined how onboarding practices can create psychological conditions that support engagement, particularly in early employment stages when interpretations of organisational support and identity cues are forming (Kahn, 1990; Saks, 2006).

At the same time, HRM is undergoing an ongoing digital transformation in which HR processes are redesigned through electronic and analytics-enabled systems (Bondarouk & Ruël, 2009; Strohmeier, 2007). This transformation is not limited to administrative efficiencies; it increasingly targets experience-centric processes such as learning, socialisation, and employee support (Marler & Boudreau, 2017; Stone et al., 2015). Immersive technologies, especially VR, represent a distinctive development within this landscape because they can create compelling experiences of "being there" and facilitate behavioural rehearsal in simulated environments (Slater, 2009; Slater & Wilbur, 1997). Compared to conventional digital onboarding materials (e.g., static modules, slides, or videos), VR and related technologies may increase the vividness and interactivity of orientation, safety training, cultural assimilation activities, and scenario-based learning (Bowman & McMahan, 2007; Sherman & Craig, 2003). Adjacent emerging technologies such as AR overlays, gamified onboarding experiences, and AI-enabled chatbots can similarly support just-in-time guidance, feedback, and learning-by-doing (Bacca et al., 2014; Deterding et al., 2011; Følstad & Brandtzæg, 2017). However, the organisational outcomes of these tools are not guaranteed. Their influence depends on how technology features shape newcomer cognition, affect, and social experience; on how effectively organisations integrate tools into coherent socialisation practices; and on how newcomers perceive usefulness, ease of use, and fit (Davis, 1989; Venkatesh et al., 2003).

The purpose of this paper is to develop and operationalise a theoretically grounded model of how VR and emerging onboarding technologies influence employee engagement. Building on organisational socialisation

theory (Van Maanen & Schein, 1979; Wanberg, 2012), engagement theory (Kahn, 1990; Schaufeli et al., 2002), and media-based perspectives on richness, social presence, and immersive experience (Daft & Lengel, 1986; Short et al., 1976; Steuer, 1992), the paper proposes that technology-enabled onboarding affects engagement indirectly by improving proximal onboarding outcomes such as role clarity, perceived organisational support, and self-efficacy. The paper also proposes boundary conditions related to technology acceptance and perceived quality of the immersive experience (Davis, 1989; Slater, 2009; Venkatesh et al., 2003). In doing so, the manuscript contributes a coherent explanation for why immersive onboarding may work, when it may not, and how HR leaders can design technology-enabled onboarding that is both effective and ethically defensible (Bondarouk & Ruël, 2009; Marler & Boudreau, 2017).

II. Literature Review and Theoretical Background

Digital HRM, e-HRM, and the emergence of technology-enabled onboarding

Research on electronic human resource management (e-HRM) describes how organisations reconfigure HR activities through information systems that alter how HR services are delivered and experienced (Bondarouk & Ruël, 2009; Strohmeier, 2007). As technology becomes embedded in talent practices, HRM increasingly incorporates digital tools to support learning, communication, and employee experience, while HR analytics extends measurement and prediction into domains such as performance, retention, and workforce planning (Marler & Boudreau, 2017; Stone et al., 2015). In this context, onboarding is a natural candidate for technological innovation because it includes information dissemination, skills training, social connection, and ongoing support processes that are amenable to digitisation and personalisation (Wanberg, 2012). Yet e-HRM scholarship also notes that technology changes not only efficiency but also power relations, privacy expectations, and employees' experiences of organisational support, thereby making careful design and governance essential (Bondarouk & Ruël, 2009; Stone et al., 2015).

Emerging technologies relevant to onboarding can be grouped conceptually by the experiences they afford. Conversational agents can provide scalable, always-available responses to common newcomer questions and can reduce friction in information seeking (Følstad & Brandtzæg, 2017). Gamified systems can strengthen motivation by embedding tasks in feedback-rich, progress-oriented experiences (Deterding et al., 2011; Koivisto & Hamari, 2019). AR can layer contextual guidance onto physical or digital workspaces, potentially improving situated learning and reducing errors in early task execution (Bacca et al., 2014). VR differs from these tools in degree because it can create immersive environments with high perceptual vividness and interactivity, enabling simulated tours, role-play, hazard identification, and behavioural rehearsal without the constraints of physical location (Bowman & McMahan, 2007; Slater & Wilbur, 1997).

Virtual reality, immersion, and presence as mechanisms of learning and social experience

Virtual reality has been conceptualised as a communication medium characterised by vividness and interactivity that can generate telepresence, or the subjective experience of "being" in the mediated environment (Steuer, 1992). Later work distinguishes technological immersion from psychological presence, emphasising that realistic behavioural responses can occur when users experience both a sense of place and the plausibility of events unfolding in the virtual environment (Slater, 2009; Slater & Wilbur, 1997). From a design standpoint, immersion depends on factors such as sensory fidelity, tracking, interaction modalities, and system responsiveness, while user outcomes depend on how those features support attention, agency, and comprehension (Bowman & McMahan, 2007; Sherman & Craig, 2003). These properties matter for onboarding because early employment involves uncertainty reduction, identity construction, and learning new routines; immersive experiences may support these processes by allowing newcomers to practice tasks and explore environments in ways that are difficult to replicate through text- or video-based materials (Slater, 2009; Steuer, 1992).

Evidence from simulation-based learning suggests that interactive, scenario-based environments can enhance learning outcomes relative to less interactive instruction, particularly when simulations align with learning objectives and provide feedback (Sitzmann, 2011). Meta-analytic research on virtual reality-based instruction in education similarly reports positive average effects on learning outcomes, although effects vary by design quality and context (Merchant et al., 2014; Radianti et al., 2020). While much of this evidence derives from educational or training contexts rather than onboarding specifically, it is theoretically relevant because onboarding includes training and learning components, and because newcomer adjustment depends partly on mastering role requirements and task routines (Bauer et al., 2007; Chao et al., 1994). Thus, VR's potential value in onboarding is plausibly mediated by learning and self-efficacy, rather than being a direct or universal effect of technology novelty (Bandura, 1977; Sitzmann, 2011).

Organisational socialisation and onboarding outcomes

Organisational socialisation theory conceptualises onboarding as a process through which newcomers learn the knowledge, behaviours, and social norms needed to participate effectively within an organisation (Van

Maanen & Schein, 1979; Wanberg, 2012). Empirical research identifies multiple dimensions of socialisation content, including understanding organisational history and goals, developing interpersonal relationships, and clarifying role responsibilities (Chao et al., 1994). Meta-analytic findings show that socialisation tactics and supportive onboarding practices predict newcomer adjustment outcomes such as role clarity, self-efficacy, and social integration, which in turn relate to attitudinal and behavioural outcomes including performance and turnover intentions (Bauer et al., 2007). These findings imply that onboarding interventions should be assessed not only by satisfaction but by whether they increase psychologically meaningful resources for newcomers, particularly clarity and confidence in task performance, as well as perceived support and inclusion (Bandura, 1977; Eisenberger et al., 1986; Rizzo et al., 1970).

Role clarity is especially central because it reduces ambiguity about expectations and responsibilities and supports effective effort allocation during early employment (Rizzo et al., 1970). Perceived organisational support similarly signals that the organisation values the employee's contributions and cares about well-being, thereby shaping reciprocity norms and motivation (Eisenberger et al., 1986). Self-efficacy, defined as beliefs about one's capability to execute actions required to manage prospective situations, shapes persistence and resilience under uncertainty, which is characteristic of early tenure (Bandura, 1977). A technology-enabled onboarding experience that improves these proximal outcomes would therefore be expected to shape more distal outcomes including engagement.

Employee engagement as a motivational state and performance-relevant outcome

Employee engagement has been conceptualised as the harnessing of organisational members' selves to their work roles such that individuals express themselves physically, cognitively, and emotionally during role performance (Kahn, 1990). The construct has also been operationalised as a persistent, positive, work-related state of mind characterised by vigor, dedication, and absorption (Schaufeli et al., 2002). Research links engagement to performance-related outcomes, and meta-analytic evidence at the business-unit level suggests that engagement is associated with desirable organisational outcomes, although causality and measurement issues remain important considerations (Harter et al., 2002; Saks, 2006). The Job Demands-Resources (JD-R) model offers a widely used explanation for engagement by proposing that job resources such as support, autonomy, and feedback foster motivational processes leading to engagement, particularly when job demands are manageable (Bakker & Demerouti, 2007). Onboarding can be interpreted through a JD-R lens as a resource-building intervention, because it may increase informational, social, and psychological resources that support motivation and prevent early strain (Bakker & Demerouti, 2007; Saks & Gruman, 2011).

Engagement is also compatible with broader motivational theories that clarify why well-designed onboarding experiences may energise newcomers. Self-determination theory argues that internalised motivation is supported when individuals experience autonomy, competence, and relatedness (Deci & Ryan, 2000). Gamified onboarding systems can potentially support competence through feedback and progress indicators, and support autonomy by enabling self-paced exploration (Deterding et al., 2011; Koivisto & Hamari, 2019). Flow theory likewise suggests that deep absorption occurs when individuals experience a balance between challenge and skill in goal-directed activity, which can be scaffolded through interactive systems and simulations (Csikszentmihalyi, 1990). These motivational perspectives are relevant because technology is not simply an information delivery channel; it is also an experience architecture that can amplify or diminish psychological conditions supportive of engagement (Kahn, 1990; Steuer, 1992).

Media richness, social presence, and the digital onboarding experience

In addition to learning and motivation, onboarding is a relational process that depends on social cues, conversational exchange, and shared understanding. Social presence theory proposes that communication media differ in the degree to which they convey the salience of others and the sense of interpersonal connection (Short et al., 1976). Media richness theory similarly argues that rich media are better suited for equivocal tasks because they support feedback, multiple cues, language variety, and personal focus (Daft & Lengel, 1986). Onboarding is often equivocal because newcomers must interpret ambiguous norms and expectations, and because they may hesitate to ask questions in ways that risk negative evaluation. Technology-enabled onboarding tools can alter this dynamic. For example, chatbots can offer low-stakes, immediate information access, potentially reducing uncertainty and improving perceived support when human access is limited (Følstad & Brandtzæg, 2017; Eisenberger et al., 1986). VR can increase social presence by enabling embodied interaction and shared virtual spaces, thereby providing richer social cues than text-based systems, although outcomes depend on implementation quality and organisational integration (Short et al., 1976; Slater, 2009). Thus, media-based theories provide a plausible account of why immersive and interactive technologies may reshape newcomer socialisation and the formation of early engagement.

Conceptual Model and Hypotheses

Synthesising the preceding literature, this study conceptualises VR and emerging onboarding technologies as experience-enabling resources that influence engagement primarily through their effects on proximal onboarding outcomes. Technology-enabled onboarding is defined here as the structured use of immersive and interactive digital tools, including VR, AR, gamified systems, and conversational agents, as part of formal newcomer socialisation. The model proposes that perceived quality of the technology-enabled onboarding experience predicts role clarity, self-efficacy, and perceived organisational support, which in turn predict employee engagement. The model also proposes that technology acceptance functions as a boundary condition because perceived usefulness and ease of use shape whether newcomers engage with the tools sufficiently for resource-building to occur (Davis, 1989; Venkatesh et al., 2003).

First, VR and emerging onboarding technologies should relate positively to role clarity because interactive simulations and structured digital guidance can make abstract role expectations concrete through scenario-based learning and repeated practice (Rizzo et al., 1970; Sitzmann, 2011). VR and AR can support situated learning by embedding information within simulated or augmented contexts, thereby reducing ambiguity and improving understanding of task sequences and standards (Bacca et al., 2014; Merchant et al., 2014). Accordingly, Hypothesis 1 states that perceived quality of technology-enabled onboarding is positively associated with role clarity (H1), consistent with organisational socialisation research that emphasises informational acquisition as a core adjustment outcome (Bauer et al., 2007; Chao et al., 1994).

Second, immersive and interactive experiences are expected to increase newcomer self-efficacy because they enable behavioural rehearsal, incremental mastery, and feedback, which are central antecedents of efficacy beliefs (Bandura, 1977; Slater, 2009). Simulation research suggests that well-designed interactive environments can enhance skill development and confidence, particularly when they allow learners to practice decision-making under realistic constraints (Sitzmann, 2011; Sherman & Craig, 2003). Therefore, Hypothesis 2 proposes that perceived quality of technology-enabled onboarding is positively associated with newcomer self-efficacy (H2).

Third, technology-enabled onboarding may strengthen perceived organisational support when the organisation's investment in structured support tools signals care and value, and when technologies reduce informational friction and provide timely assistance (Eisenberger et al., 1986; Følstad & Brandtzæg, 2017). Digital HRM research, however, also cautions that technology can be interpreted as impersonal control unless accompanied by human support and appropriate governance (Bondarouk & Ruël, 2009; Stone et al., 2015). The present model therefore frames support as an outcome contingent on perceived quality and service orientation of the technology, not mere presence of tools. Hypothesis 3 posits that perceived quality of technology-enabled onboarding is positively associated with perceived organisational support (H3).

Fourth, onboarding outcomes are expected to predict engagement. Engagement theory argues that individuals engage more fully when they experience psychological meaningfulness, safety, and availability, conditions that are plausibly strengthened when newcomers understand expectations, feel supported, and believe they can perform competently (Kahn, 1990; Saks, 2006). The JD-R model similarly predicts that resources such as clarity and support energise motivational processes culminating in engagement (Bakker & Demerouti, 2007). Consistent with these perspectives, Hypothesis 4 proposes that role clarity is positively associated with employee engagement (H4), and Hypothesis 5 proposes that self-efficacy is positively associated with employee engagement (H5). Hypothesis 6 further proposes that perceived organisational support is positively associated with employee engagement (H6), consistent with reciprocity arguments and evidence linking supportive HR practices to engagement (Eisenberger et al., 1986; Saks, 2006).

Fifth, the model proposes mediation. Specifically, technology-enabled onboarding is expected to influence engagement indirectly through the resource-building outcomes of role clarity, self-efficacy, and perceived organisational support. This is consistent with socialisation research indicating that onboarding tactics affect distal outcomes through adjustment indicators (Bauer et al., 2007; Chao et al., 1994) and with the JD-R view of engagement as the result of accumulated resources (Bakker & Demerouti, 2007). Thus, Hypothesis 7 posits that the relationship between perceived quality of technology-enabled onboarding and employee engagement is mediated by role clarity, self-efficacy, and perceived organisational support (H7).

Finally, the model proposes a boundary condition based on technology acceptance. Even highly immersive tools will have limited effect if newcomers perceive them as difficult to use or irrelevant to role success (Davis, 1989; Venkatesh et al., 2003). Acceptance is therefore expected to strengthen the association between technology-enabled onboarding quality and onboarding outcomes by increasing exposure and engagement with the tools. Hypothesis 8 states that technology acceptance positively moderates the relationship between technology-enabled onboarding quality and onboarding outcomes, such that relationships are stronger at higher levels of perceived usefulness and ease of use (H8).

III. Methodology

Research design

To examine the proposed relationships while reducing common method inflation, this study is designed as a time-lagged survey of employees who have joined their organisation within the previous six to twelve months, a period frequently used to capture newcomer adjustment processes (Bauer et al., 2007; Wanberg, 2012). At Time 1, respondents report their experiences with VR and emerging onboarding technologies, the perceived quality of those experiences, and technology acceptance. At Time 2, administered four to eight weeks later, respondents report onboarding outcomes, including role clarity, self-efficacy, and perceived organisational support. At Time 3, administered an additional four to eight weeks later, respondents report employee engagement. This staging is consistent with theoretical claims that onboarding practices influence adjustment outcomes that subsequently shape engagement (Bakker & Demerouti, 2007; Kahn, 1990). The study can be implemented within one organisation using multiple onboarding cohorts or across multiple organisations to improve external validity, consistent with e-HRM research that emphasises context-sensitive implementation (Bondarouk & Ruël, 2009; Strohmeier, 2007).

Sample and data collection

The target population comprises employees who have experienced technology-enabled onboarding components, including VR modules, AR-guided training, gamified onboarding tasks, or chatbot-based support. Recruitment can occur through HR departments or professional networks, with care taken to avoid coercion and to ensure voluntary participation (Stone et al., 2015). Because onboarding experiences differ by job type, the sampling strategy should aim for occupational and departmental diversity, and analyses should control for tenure, role type, and prior familiarity with immersive technologies, which may shape user perceptions and learning (Bowman & McMahan, 2007; Venkatesh et al., 2003). Power considerations depend on the analytic approach; structural equation modelling typically benefits from moderate to large samples, particularly when testing mediation and moderation paths (Bakker & Demerouti, 2007; Schaufeli et al., 2002). The present design therefore anticipates a sample sufficient to support confirmatory measurement modelling and structural path estimation, while acknowledging that access constraints may require partial least squares modelling or simplified regression approaches in some settings (Marler & Boudreau, 2017).

Measures

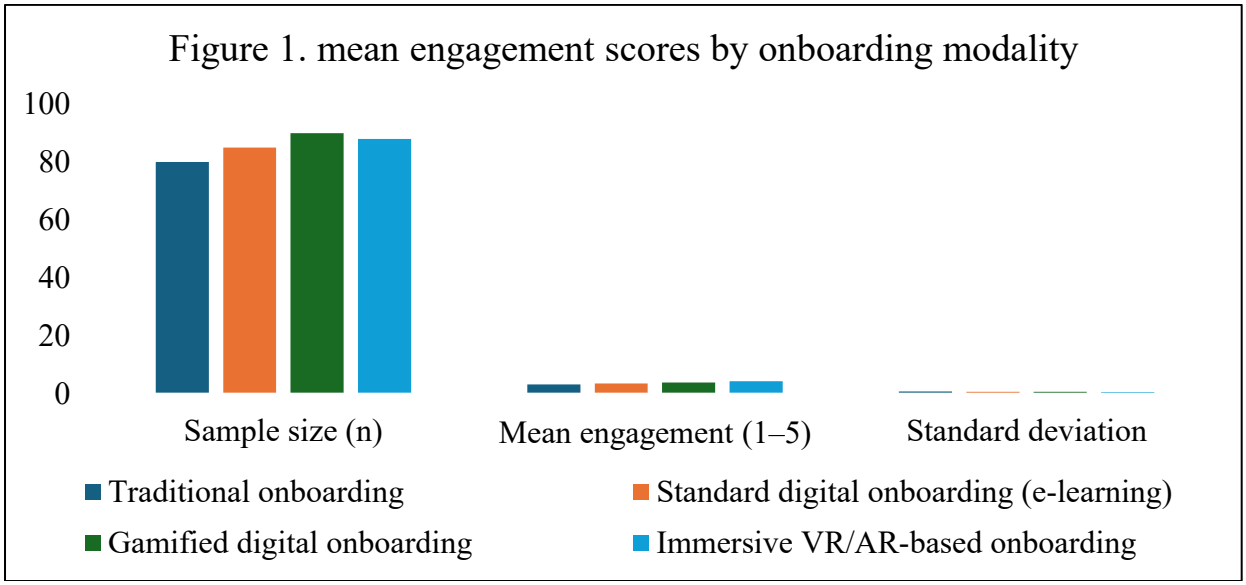
Technology-enabled onboarding quality is conceptualised as a multi-faceted perception capturing immersion, interactivity, usability, and perceived instructional value. Items can be adapted to reflect telepresence and immersive experience concepts, drawing on the idea that vividness and interactivity shape the subjective sense of being in the environment and the plausibility of events (Steuer, 1992; Slater, 2009). Practical operationalisation should also reflect design considerations about "how much immersion is enough" for learning and comfort, given that excessive complexity may not improve outcomes (Bowman & McMahan, 2007; Sherman & Craig, 2003). Emerging technologies beyond VR can be captured through self-reports indicating whether employees used AR, gamified modules, or chatbots, with perceived quality assessed in analogous terms such as responsiveness, clarity, and perceived helpfulness (Bacca et al., 2014; Følstad & Brandtzæg, 2017; Koivisto & Hamari, 2019).

Technology acceptance is measured using perceived usefulness and perceived ease of use constructs, consistent with technology acceptance research that predicts adoption and continued use (Davis, 1989). For broader acceptance, the unified theory of acceptance and use of technology provides guidance on how expectancy and facilitating conditions shape use intentions and behaviours (Venkatesh et al., 2003). Role clarity is measured using established role ambiguity/clarity items, reflecting the extent to which employees understand responsibilities and expectations (Rizzo et al., 1970). Self-efficacy is measured using items that capture confidence in performing role-related tasks, consistent with Bandura's conceptualisation of efficacy beliefs (Bandura, 1977). Perceived organisational support is measured using items reflecting the perception that the organisation values the employee and cares about well-being (Eisenberger et al., 1986). Employee engagement is measured using the Utrecht Work Engagement Scale, capturing vigor, dedication, and absorption, and consistent with the conceptualisation of engagement as a positive, persistent work-related state (Schaufeli et al., 2002). Control variables include demographic characteristics, prior experience with VR or advanced digital tools, and role characteristics, given evidence that technology perceptions and socialisation experiences vary across individuals and contexts (Bauer et al., 2007; Venkatesh et al., 2003).

IV. Data analysis strategy

Analyses begin with data screening, reliability assessment, and confirmatory factor analysis to establish measurement validity and discriminant validity among key constructs, consistent with best practice in engagement and socialisation research (Schaufeli et al., 2002; Saks, 2006). Structural equation modelling can then test the hypothesised paths and indirect effects, enabling simultaneous estimation of mediation and moderation where

sample size permits (Bakker & Demerouti, 2007; Bauer et al., 2007). Indirect effects can be assessed through bootstrapped confidence intervals, which are commonly used for mediation testing. Moderation by technology acceptance can be tested via interaction terms or multi-group analyses based on acceptance levels, consistent with acceptance theory's emphasis on heterogeneity in user response (Davis, 1989; Venkatesh et al., 2003). Because technology-enabled onboarding may differ substantially across organisations and systems, additional robustness checks can include organisation fixed effects (in multi-organisation samples) or cohort controls (in single-organisation, multiple-cohort designs), consistent with e-HRM's context-sensitive implementation perspective (Bondarouk & Ruël, 2009; Strohmeier, 2007).



Ethical considerations

Technology-enabled onboarding raises distinctive ethical and governance issues, especially when immersive tools or analytics platforms generate behavioural data. HR analytics research highlights both strategic potential and ethical risk, including privacy concerns and opaque decision-making (Marler & Boudreau, 2017). e-HRM research similarly warns that technology can shift perceptions of control and surveillance if employee data are collected without transparency and consent (Bondarouk & Ruël, 2009; Stone et al., 2015). Accordingly, the study requires informed consent that clarifies the purpose of research, voluntary participation, confidentiality, and the absence of employment consequences for participation or nonparticipation. Where organisational access is used, safeguards should ensure that supervisors cannot identify individual responses, and that results are reported in aggregate form (Stone et al., 2015). These ethical measures are essential not only for research compliance but also because perceived organisational support and trust can be harmed when employees interpret technology use as exploitative (Eisenberger et al., 1986; Bondarouk & Ruël, 2009).

V. Discussion

The proposed model advances onboarding and engagement research by clarifying how VR and emerging technologies are expected to influence employee engagement through specific adjustment resources. A central implication is that the effectiveness of technology-enabled onboarding should not be inferred from novelty or satisfaction alone. Instead, VR and related tools are predicted to matter when they measurably increase role clarity, strengthen self-efficacy through practice and feedback, and signal organisational support through accessible, service-oriented design (Bandura, 1977; Eisenberger et al., 1986; Rizzo et al., 1970). This aligns with newcomer adjustment research that conceptualises onboarding as a mechanism for building job-related and social resources that predict downstream outcomes (Bauer et al., 2007; Chao et al., 1994), and with engagement theory that foregrounds the psychological conditions under which employees invest their full selves in work roles (Kahn, 1990; Saks, 2006). It also aligns with the JD-R framework, which predicts that resource gains catalyse motivational processes culminating in engagement (Bakker & Demerouti, 2007).

The model further contributes by integrating media-based and presence-based perspectives into onboarding theory. Media richness and social presence theories imply that onboarding an equivocal, socially embedded process benefits from communication channels that support feedback, multiple cues, and a sense of interpersonal connection (Daft & Lengel, 1986; Short et al., 1976). VR's distinctive affordance is that it may elevate the subjective experience of "being there" and can thereby support situated learning and social presence in ways not available through leaner media (Slater, 2009; Steuer, 1992). However, presence and immersion are

not intrinsically beneficial; VR can create cognitive overload, discomfort, or distraction if poorly designed or mismatched to learning objectives (Bowman & McMahan, 2007; Sherman & Craig, 2003). The model therefore treats perceived quality as the operative predictor, consistent with evidence that simulation effectiveness depends on design features and instructional alignment (Sitzmann, 2011; Radianti et al., 2020).

The inclusion of emerging technologies beyond VR reflects the reality that contemporary onboarding ecosystems are often hybrid, combining multiple tools across devices and channels. For example, AR can provide contextual assistance during early task performance, which may directly reduce errors and strengthen competence perceptions (Bacca et al., 2014). Gamification, when grounded in motivational principles rather than superficial reward structures, may enhance engagement by supporting competence and sustained involvement in learning tasks (Deci & Ryan, 2000; Deterding et al., 2011; Koivisto & Hamari, 2019). Evidence on gamification's effectiveness is mixed and context-dependent, suggesting that design and implementation quality are crucial moderators of outcome (Hamari et al., 2014; Koivisto & Hamari, 2019). Chatbots can provide scalable, low-friction access to information, potentially supporting perceived organisational support and reducing the social cost of asking "basic" questions, though effectiveness depends on accuracy and conversational quality (Følstad & Brandtzæg, 2017; Eisenberger et al., 1986). In this sense, the model conceptualises "emerging technologies" as a coordinated set of supports that can either amplify or undermine onboarding resources depending on integration, governance, and employee interpretation (Bondarouk & Ruël, 2009; Stone et al., 2015).

From a practical standpoint, the model implies that organisations should evaluate technology-enabled onboarding by tracking whether newcomers emerge with clearer role expectations, greater confidence, and stronger perceptions of support, rather than by relying on completion metrics alone (Rizzo et al., 1970; Bandura, 1977; Eisenberger et al., 1986). HR analytics can contribute by measuring these intermediate outcomes and linking them to engagement and retention indicators, while maintaining ethical safeguards to avoid surveillance concerns and trust erosion (Marler & Boudreau, 2017; Stone et al., 2015). Additionally, technology acceptance should be treated as a design target rather than an afterthought, because perceived usefulness and ease of use shape whether onboarding tools are engaged deeply enough to produce resource gains (Davis, 1989; Venkatesh et al., 2003). This is particularly salient for VR, where usability constraints and discomfort can quickly reduce adoption, limiting any downstream effects on adjustment and engagement (Bowman & McMahan, 2007; Slater & Wilbur, 1997).

Limitations and Future Research

The proposed design, while theoretically grounded, has limitations that future research should address. First, time-lagged surveys reduce but do not eliminate concerns about self-report bias and common method variance, and future studies would benefit from multi-source data such as supervisor ratings, onboarding completion logs, or objective performance indicators, while carefully managing privacy and consent (Marler & Boudreau, 2017; Stone et al., 2015). Second, causal inference remains limited without experimental or quasi-experimental designs. Future research can implement cohort-based comparisons where some cohorts receive VR-enabled onboarding and others receive standard onboarding, thereby enabling stronger causal claims, consistent with the broader training evaluation tradition in simulation research (Sitzmann, 2011; Merchant et al., 2014). Third, the model currently treats "technology-enabled onboarding quality" as a unified perception; future research should unpack design dimensions such as presence, interaction fidelity, feedback mechanisms, and social affordances, as these may have distinct effects on clarity, efficacy, and support (Slater, 2009; Steuer, 1992; Sherman & Craig, 2003). Finally, contextual factors such as job complexity, organisational culture, and managerial support may condition technology's effects. Organisational socialisation theory suggests that tactics and social dynamics interact with individual differences and context, implying that technology should be studied as part of a broader socialisation system rather than a standalone intervention (Van Maanen & Schein, 1979; Wanberg, 2012).

VI. Conclusion

This paper develops a theoretically integrated account of how VR and emerging technologies can influence employee onboarding and engagement. By synthesising organisational socialisation research with engagement theory and media-based perspectives on presence and communication richness, the paper argues that technology-enabled onboarding is most likely to foster engagement when it builds newcomer resources: role clarity, self-efficacy, and perceived organisational support (Bakker & Demerouti, 2007; Eisenberger et al., 1986; Kahn, 1990). The proposed model and methodology provide a basis for empirical testing and for more precise evaluation of immersive onboarding initiatives. As organisations continue to invest in digital HRM, this framework encourages a shift from technology novelty toward resource-building effectiveness and ethical implementation, thereby supporting both employee well-being and organisational performance goals (Bondarouk & Ruël, 2009; Harter et al., 2002; Stone et al., 2015).

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