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Performance Assessment through Work Gamification: Investigating Engagement

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Purpose: The purpose of this study is to evaluate, investigate and assess the impact of gamification on the performance of online transportation drivers via social values, motivation and participatory engagement.

Design/methodology/approach: This quantitative study is based on primary data from 110 online transportation drivers in five cities in the Central Java Province region: Semarang, Pekalongan, Kudus, Purwokerto and Solo. Partial least squares (PLS) method is used to analyse and evaluate data.

Findings/results: The research results show that job gamification positively and significantly influences driver performance through social value, motivation and participatory engagement.

Practical implications: The findings can be applied to increase employee performance in a business or organisation that supports a sustainable, friendly company. They also offer practical basics to make decisions in increased employee engagement, enhanced productivity, improved learning and skill development, social value and collaboration.

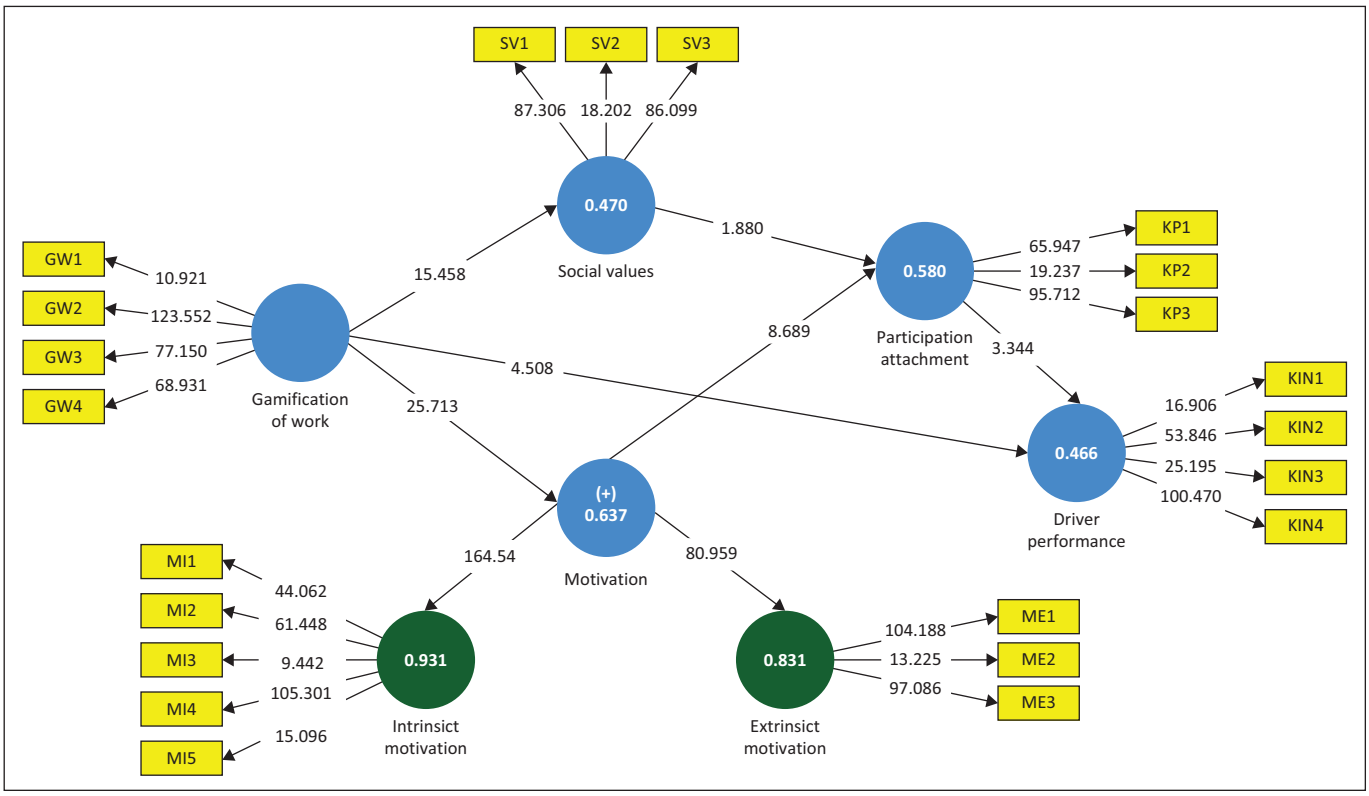
Originality/value: While the study establishes a positive relationship between gamification and driver performance through the mediating factors of social value, motivation and participatory engagement, future research could delve deeper into understanding the specific gamification techniques. Those design elements are also the most effective in the context of online transportation. Additionally, exploring potential moderating factors, such as the demographics of drivers or market conditions, could provide a more nuanced understanding of the gamification-performance relationship. This in-depth exploration could help transportation companies tailor their gamification strategies for maximum impact and address potential limitations in current research.

Keywords: gamification of work; online transportation; participatory attachment; motivation; social values.

Introduction

The evolution of technology had a transformative impact on human life, marked by digitalisation in the social life of the people (Siahaan & Legowo, 2019; Voronkova et al., 2023). In society, the integration of technology into daily activities is progressively expanding, with digital technology being employed to meet various needs and enhance the well-being and convenience of human life (Kolade & Owoseni, 2022). This trend is evident through the growing use of digital technology, the internet and digital media platforms. As of January 2023, the global number of internet users was reported to have reached 5.16 billion people. Figure 1 represents approximately 64.4% of the global population, which stands at 8.01 billion people (Annur, 2023). According to research data from 2023, people spend a minimum of 145 min or approximately 17 h per week using the Internet on a daily basis. Indonesia spends an average of 8 h 36 min a day on the Internet (Zulfikar, 2023). This significant level of Internet usage indicates the growing dependence of individuals on technology in various aspects of their lives, including the use of an online transportation application and the integration of gamification for performance evaluation (Njoku et al., 2023; Yen et al., 2023).

Up to this point, the existing literature tends to highlight the application of gamification in three perspectives. The first study examined gamification in the field of education (Lumsden et al., 2023; Schöbel et al., 2023). Researchers pointed out that gamification can help address motivation issues (Chu & Fowler, 2020; Keremedchiev et al., 2020; Ros et al., 2020; Yaşar et al., 2020). Gamification generally builds interpersonal relationships by providing feedback and creating a positive learning environment that supports student motivation to learn (Chugh & Turnbull, 2023;



MI, intrinsic motivation; KIN, driver performance; ME, extrinsic motivation; GW, gamification of work; KP, participation attachment; SV, social value.

FIGURE 1: Estimation results of the PLS model by bootstrapping 110 samples.

Hufnagel, 2020). Oliveira et al. (2020) presented contrasting findings, indicating that gamification has a contradictory effect on performance outcomes in education (McHenry & Makarius, 2023). Meanwhile, the second study examined gamification in economics, client building relationships and human resource management (Vivek et al., 2021; Woźniak, 2017). The study revealed a notable impact of the point system in enhancing external motivation. This suggests that extrinsic rewards such as the award of points influence segments of the user population to participate more intensely when a point system is implemented (Dung et al., 2020; Lucassen & Jansen, 2014; Toda et al., 2018). In contrast, another study exhibited different results, indicating that gamification can inhibit intrinsic motivation as reward provision is perceived as controlling, leading to feelings of helplessness, incompetence and a decline in intrinsic motivation (Hanus & Fox, 2015; Nikolaou et al., 2019).

Research has highlighted gamification's impact on education and economics, but its role in online transportation remains underexplored. Although its benefits are recognised in various sectors, the mechanisms through which it affects online transportation drivers' motivation, social value and engagement are not well understood. More studies are needed to understand its influence on user behaviour, performance and experience.

This study aims to explore, test and analyse the influence of gamification on the performance of online transportation drivers, specifically examining its social value, motivation and participative engagement. Gamification design is used in organisational behaviour, particularly for employee performance evaluation (Ahmadi, 2020; Nasirzadeh & Fathian, 2020). Gamification has shown effectiveness in engaging and improving work performance across various types of workers, including employees in different industries and sectors (Chen, 2015). High mobility, partnership-based relationships and the increasingly significant use of digital technology in companies cause the performance appraisal process to change from conventional to modern. Gamification can measure employee performance using game design incorporated into the work system (Bizzi, 2023; Ikhide et al., 2022). The incorporation of game design into the work system enables gamification to effectively assess employee performance (Bizzi, 2023; Ikhide et al., 2022).

Literature review

Gamification

Gamification serves as a means to motivate individuals, increase participation and foster engagement among members by applying game design elements and mechanics in a non-game context (Gerdenitsch et al., 2020; Seaborn & Fels, 2015). The utilisation of gamification mechanisms and elements, such as awarding points, badges, levels and leaderboards, will create an enjoyable experience (Bizzi, 2023; Mekler et al., 2013; Zainuddin et al., 2020). The implementation of gamification at work changes behaviour and motivation. Over the past few years, gamification has become a major trend (Wünderlich et al., 2020). Organisations leverage the motivational potential of games in a non-gaming context, for example, with customers and employees, to encourage and

enhance user engagement. Game elements such as points and leaderboards are chosen to motivate users to continuously use the service (Seaborn & Fels, 2015; Yen et al., 2023). Therefore, the successful implementation of gamification requires alignment with the user goals and needs to ensure meaningful engagement and sustainable behaviour change.

In Japan, an Octalysis framework developed by Yu-kai Chou provides a deeper look at how gamification elements can be organised to maximise their motivational effects (Bhattacharya, 2019; Chou, 2012). This framework has been used in several studies recommending that this framework strongly supports the application of gamification for organisations (Oliveira & Cruz, 2018; Retnowati et al., 2022). The Octalysis framework identifies eight core behavioural drivers that can influence user participation, including: (1) Epic Meaning and Calling, which is to inspire users with a greater mission and purpose; (2) Development and Accomplishment, which is to give users a sense of achievement through tasks and challenges; (3) Empowerment of Creativity and Feedback, which is an aspect to give users the freedom to explore and adapt their experience; (4) Ownership and Possession, which is an aspect to encourage a sense of ownership and investment in the results of their work; (5) Social Influence and Relatedness, which are aspects that utilise social influence to increase engagement through cooperation or competition; (6) Scarcity and Impatience, which are aspects that create desire with elements of scarcity and exclusivity; (7) Unpredictability and Curiosity, which are efforts to keep users interested with elements of surprise and novelty; (8) Loss and Avoidance, which is the aspect of avoiding losing progress or status that has been achieved. The Octalysis framework in gamification design allows organisations to be more careful in selecting the most effective elements according to organisational goals and user needs. By using this framework, gamification becomes more engaging and more strategic in achieving desired results. Implementing gamification regarding Octalysis provides a more holistic and focused approach, ensuring that every aspect of gamification is designed to maximise user engagement and support overall organisational goals. This is important in ensuring that gamification is fun and effective in generating positive behavioural change and sustainable productivity.

Previous research has primarily focused on examining the influence of gamification in work contexts, particularly among drivers of online transportation services such as Go-Jek (Putranti et al., 2020; Retnowati et al., 2022). These studies have highlighted how gamification can enhance driver motivation and engagement, with key factors such as achievement, empowerment and social influence being identified as crucial in boosting work engagement. Traditionally, these studies have employed methodologies such as Soft Systems Methodology and the Multi-Factor Evaluation Process (Retnowati et al., 2022), alongside qualitative sense-making through interviews (Putranti & Retnowati, 2021). However, several critical gaps and areas remain underexplored within this body of research, necessitating further investigation.

Firstly, there is a need to delve deeper into how gamification fulfils basic psychological needs. While the existing research has predominantly focused on the enhancement of extrinsic motivation through rewards and incentives (Putranti & Retnowati, 2021), there has been less emphasis on how gamification impacts intrinsic psychological needs such as competence, autonomy and relatedness. Previous studies have not adequately demonstrated how gamification elements can satisfy this intrinsic context. To address this gap, self-determination theory (SDT) will be utilised as it provides a robust framework for understanding how to meet these intrinsic needs, which are associated with sustained high-quality motivation and job satisfaction. Secondly, the long-term effects of gamification on intrinsic motivation and work engagement are yet to be thoroughly explored. The existing study discusses only the short-term impacts (Retnowati et al., 2022) leaving a significant gap in understanding the enduring consequences of gamification. Therefore, SDT was chosen as a theoretical foundation to explore these long-term influences on intrinsic motivation.

Thirdly, there is an observed generalisation in the effects of gamification across different studies, without adequate consideration for individual variations or diverse operational contexts (Putranti & Retnowati, 2021; Retnowati et al., 2022). Future research needs to investigate these individual intrinsic values more profoundly. Self-determination theory is particularly suited for this exploration as it emphasises the importance of context and individual differences in influencing motivation.

Self-determination theory

In this study, SDT provides an understanding of motivation and behaviour change that encompasses the psychological processes operating within individuals (Ganotice et al., 2023; Hamari & Koivisto, 2015; Hanus & Fox, 2015). The SDT posits that individuals are most motivated and likely to achieve optimal well-being when their three fundamental needs, namely autonomy, competence and a sense of relatedness, are met (Ryan & Deci, 2019; Scogin et al., 2023). The SDT was selected for this new study because of its comprehensive approach to motivational psychology, which aligns well with the complexities of gamification in the workplace. By integrating SDT, the research aims to provide deeper insights into how gamification can be structured to support not just momentary engagement but long-lasting motivational and behavioural changes that enhance both individual satisfaction and organisational productivity. This theoretical grounding is expected to significantly deepen our understanding of the multifaceted impacts of gamification, thereby guiding more effective implementation strategies in online transportation and beyond.

The SDT is supported by several mini-theories (Deci et al., 2017; Ryan & Deci, 2019) that address different aspects of motivation and psychological needs. Firstly, cognitive evaluation theory (CET) emphasises the importance of

autonomy and competence in fostering intrinsic motivation (AlShaikh et al., 2024; Huyen, 2020). In the gamification context, providing drivers with choices in their tasks and routes and acknowledging their achievements can enhance engagement and satisfaction. Secondly, organismic integration theory (OIT) deals with the internalisation of extrinsic motivations (Gilal et al., 2022). For online transportation, this could involve aligning rewards with drivers' personal values and goals, such as bonuses for eco-friendly driving practices or excellent customer service. Thirdly, basic psychological needs theory (BPNT) asserts that satisfying the needs for autonomy, competence and relatedness is crucial for psychological well-being (Scogin et al., 2023; Vansteenkiste et al., 2020). Gamification strategies can be designed to meet these needs by offering meaningful challenges, giving drivers the freedom to set their schedules and creating a community platform for driver interaction and support. Fourthly, goal contents theory (GCT) explores the types of goals that promote greater well-being (Bradshaw, 2023; Zhang et al., 2018). In gamification, focusing on intrinsic goals such as community building, self-improvement, and personal growth can lead to more sustainable motivation than extrinsic rewards alone. Fifthly, relationship motivation theory (RMT) highlights the importance of relatedness and warm, secure relationships (Koole et al., 2019; Legault, 2016). For drivers, gamification can encourage positive interactions, enhancing connection and belonging. Integrating these elements into gamification boosts motivation, engagement, performance and job satisfaction. Management fosters a supportive work environment by promoting teamwork and autonomy (Deci et al., 2017; Heiberg et al., 2022; Riatmaja et al., 2020). Meeting these needs not only leads to higher quality and sustainable performance (Croitor et al., 2021; Morschheuser & Hamari, 2019) but also ensures that employees who feel in control of their tasks and competent in their roles are more likely to deliver superior results.

The motivation central to this gamification study aims to influence the user's engagement with activities positively (Jaskari & Syrjälä, 2022; Sotos-Martínez et al., 2023). Gamification can create experiences in the workplace that allow employees to feel like their demands are met. The use of rewards in gamification as incentives for performance, such as points, badges or recognition, promotes the SDT by promoting competence and acknowledging achievements (Koivisto & Hamari, 2019; Mekler et al., 2017). Furthermore, gamification fosters cooperation, communication and engagement among employees, building a positive social environment (Morschheuser & Hamari, 2019; Shpakova et al., 2020). By combining gamification with SDT, organisations can bolster employee motivation and engagement, promoting skill development and enhancing overall job satisfaction through point-based rewards and challenges. This integration of SDT and gamification is demonstrated to be effective in boosting job enjoyment and productivity, particularly among leadership roles (Jaskari & Syrjälä, 2022; Thomas & Baral, 2023). Implementing gamification in the online transportation sector by incorporating SDT principles ensures that drivers not only engage more deeply with their tasks but also experience increased satisfaction and performance in their roles. This enhances service quality and operational efficiency, illustrating the universal role of games and gamification in enhancing human life and productivity (Gerdenitsch et al., 2020; Nasirzadeh & Fathian, 2020; Seaborn & Fels, 2015).

The SDT represents one of the most established theoretical foundations in gamification research (Wang et al., 2021). Quantitative findings demonstrated positive effects of work gamification on job enjoyment and productivity, specifically for employees with leader responsibilities (Jaskari & Syrjälä, 2022; Thomas & Baral, 2023). Individual employees from various organisations are taking the initiative to actively employ gamification, promoting the implementation of gamification in their workplace as a means to increase employee productivity and motivation (Legaki & Hamari, 2020; Putra Rahmadhan et al., 2023). Providing feedbacks on progress and offering rewards are elements used in games; the implementation of these elements in a work context is commonly referred to as gamification (Nasirzadeh & Fathian, 2020). By incorporating game mechanism and elements, an enjoyable experience can be achieved. The emerging gamification illustrates the universal role of games and the role of games in human life (Gerdenitsch et al., 2020; Nasirzadeh & Fathian, 2020; Seaborn & Fels, 2015).

Gamification of work towards social value

In addition to providing a pleasant and enjoyable work experience, the implementation of gamification of work also motivates people and encourages positive changes and behaviours that reflect awareness of social values (Dzandu et al., 2022). Online transportation platforms further foster these values through features such as customer testimonials, bridging positive interactions between customers and drivers (Kusumawardani et al., 2023). The social interactions within online driver communities, where members share achievements, care for each other and provide positive feedback, are significantly amplified by gamification. This fosters a sense of unity, strengthens relationships and motivates customers to remain engaged (Jun et al., 2020).

The literature reviews indicate that social values arise from interconnectedness, promoting positive behaviour, heightened social awareness and active participation in gamified work environments that are both competitive and socially valuable (Bhalla & Sareen, 2020). By integrating SDT and its mini-theories along with the Octalysis framework, this research provides a comprehensive theoretical basis for understanding how gamification influences social values. Firstly, CET and OIT from SDT emphasise how autonomy and the internalisation of extrinsic motivations promote behaviours aligned with personal and societal values. Secondly, BPNT illustrates that meeting needs for autonomy, competence and relatedness encourages pro-social behaviours beneficial to the community. Thirdly, GCT and RMT highlight the importance of intrinsic goals and relationships in fostering sustainable and value-driven

behaviour. Fourtly, the Octalysis framework identifies 'Social Influence & Relatedness' and 'Epic Meaning & Calling' as critical drives that influence user behaviour towards greater communal and societal contributions. From this theoretical grounding, the first hypothesis of this research can be formulated as follows:

H_1: There is an influence of gamification of work on social values.

Gamification of work, motivation, social value and participatory attachment

Gamification involves incorporating game elements and mechanics into non-gaming environment to increase user engagement and motivation. This annotative approach aims to create engaging and enjoyable interactive experiences and improve customer loyalty (Alsaad & Durugbo, 2021). In the context of innovation, gamification is understood in three distinct aspects: as an intervention, as an induction and as an investigation. As an intervention, it uses game elements to boost user engagement, productivity and sustainable practices. As an induction, it focuses on fostering innovation and interactivity by integrating game-based approaches that combine both game and reward systems. As an investigation, it utilises gaming techniques to enhance reward-orientated investigation processes (Alsaad & Durugbo, 2021).

The overarching goal of gamification is to influence user behaviour by providing services that offer enjoyable experiences reminiscent of games (Huotari & Hamari, 2012). By merging corporate objectives with entertaining gaming experiences, gamification boosts employee and user engagement, fosters stronger relationships and drives customer involvement for heightened productivity (Aparicio et al., 2021; Bhalla & Sareen, 2020). Online transportation services, designed as games offering points and rewards, harness the enjoyable experience to motivate users, driving them to continually enhance their service quality.

Motivation is the internal drive that forces individuals to act or engage in behaviours directed towards achieving a specific goal (Morsink et al., 2022). The SDT provides a conceptual framework for understanding motivation, which is driven by the satisfaction of three basic psychological needs: autonomy, relatedness and competence (Ganotice et al., 2023). Ryan and Deci (2000) cited that intrinsic motivation arises from genuine interest, while extrinsic motivation is driven by external rewards or deadlines. Gamification in online services combines these motivations, enhancing user experience through engaging designs and fostering social interactions, while also offering tangible rewards such as ratings or tips.

Using the frameworks of SDT and the Octalysis gamification, which categorises motivational drivers into eight core drives that influence behaviour, we can analyse how gamification impacts motivation and social values. The core drives related to empowerment, social influence and unpredictability are particularly relevant here, as they are likely to foster a deep sense of engagement and participatory attachment.

Based on these theoretical underpinnings, the study formulates the following hypotheses to be explored:

H_2: There is an effect of gamification of work and motivation, predicated on the enhancement of intrinsic and extrinsic motivational factors as outlined by SDT and reflected through the motivational drives identified in the Octalysis framework.

H_3: There is an influence of participatory attachment on social value, supported by the increased engagement and interconnectedness fostered by gamification strategies that satisfy the basic psychological needs of autonomy, relatedness and competence.

Motivation and participatory engagement

Gamification, widely utilised across various sectors including online transportation, harnesses game elements to promote user enjoyment, positive behavioural changes and increased participatory involvement (Jun et al., 2020; Kusumawardani et al., 2023; Schöbel et al., 2023). Motivation is the psychological state that compels individuals to act and persist in their effort towards goal attainment. In gamification contexts, this motivational force is crucial, driving users to actively participate, engage and interact, which is essential for successfully performing tasks (Alsawaier, 2018; Almiawi et al., 2020).

Gamification leverages both intrinsic and extrinsic motivations. Intrinsic motivations stem from personal drive and the desire for meaningful challenges, while extrinsic motivation is driven by tangible rewards such as points and badges. These motivations enhance user engagement by fostering a sense of achievement, recognition and interactive experience. Thus, gamification effectively boosts users' and customers' active participation in an enticing and immersive system (Dahalan et al., 2023; McHenry & Makarius, 2023; Sotos-Martínez et al., 2023; Thomas & Baral, 2023; Wang et al., 2021).

Self-determination theory and its mini-theories provide a robust framework for understanding how these motivational dynamics operate within gamified systems. According to SDT, CET suggests that intrinsic motivation can be enhanced in environments that support autonomy and competence, key elements often facilitated through gamification. Organismic integration theory explains how extrinsic rewards can be internalised when they are aligned with an individual's values and goals, enhancing their motivation beyond superficial engagement. Basic psychological needs theory indicates that meeting the needs for autonomy, competence and relatedness is crucial for high-quality motivation and engagement, which gamification can facilitate. Additionally, the Octalysis framework, which categorises motivational drivers into eight core drives, provides insights into how specific game elements can motivate users by fulfilling psychological needs and fostering

desired behaviours. Core drives such as 'Epic Meaning and Calling' and 'Social Influence and Relatedness' are particularly relevant in explaining how gamification fosters participative attachment and communal engagement.

Based on this integration of SDT, its mini-theories and the Octalysis framework, the following hypothesis can be formulated:

H_4: There is an influence of motivation and participative attachment.

Gamification of work and performance

In conventional instructional methods, individuals receive their grades based on task performance when they demonstrate achievements. However, in gamification, efforts are acknowledged through badges or points, and there is an evaluation of performances (Da Rocha et al., 2021; Faust, 2021). In a gamified setting, individuals are motivated to actively engage in the process and their progress is assessed based on their achievement (Hanus & Fox, 2015). The use of work gamification can improve performance by leveraging the idea that an enjoyable work experience facilitated through thoughtful game design, can motivate individuals, increase engagement and positively influence through effective collaboration (Bahadoran et al., 2023). This approach is particularly impactful for online transportation drivers, leading to enhanced performance and continual improvement (Bizzi, 2023)

Self-determination theory and its mini-theories provide a robust theoretical framework for understanding how these motivational dynamics are fostered within gamified environments: CET illustrates that enhancing intrinsic motivation through autonomy and competence in gamified settings can lead to higher engagement and better performance. Organismic integration theory details how extrinsic rewards, such as points and badges, can be internalised when they align with personal values and goals, contributing to sustained motivation and performance. The BPNT emphasises that satisfying the needs for autonomy, competence and relatedness through gamification strategies leads to improved performance and employee satisfaction. The Octalysis framework, developed by Yu-kai Chou, categorises game elements into eight core drives that motivate human behaviour. Drives such as 'Development and Accomplishment' and 'Epic Meaning and Calling' are particularly relevant for motivating online transportation drivers by making them feel valued and part of a bigger cause.

Based on the synthesis of SDT, its mini-theories and the Octalysis framework, we can propose the following hypothesis:

H_5: There is an influence of gamification of work and performance.

TABLE 1: Demographic information of the respondents.

Demographics	Frequency	Percentage
Gender		
Female	25	22.7
Male	85	77.2
Ages (years)		
< 25	19	17.2
25–30	26	23.6
30–35	18	16.3
35–40	24	21.8
> 40	23	20.9
Education		
Senior high school	16	14.50
Diploma	46	41.80
Bachelor	45	40.90
Magister	3	2.70
Length of partnership (years)		
< 3	54	49.09
3–5	31	28.18
> 5	25	22.72

Methodology

In this quantitative study, the questionnaires were distributed to 150 people online using a Google Form in motorbike and car-driving communities, with 110 valid responses. The respondents hailed from cities including Semarang (38), Pekalongan (40), Purwokerto (10), Kudus (8) and Solo (14). This study suggests a model that explores how gamification impacts online driver performance, considering social values, participation attachment, and both intrinsic and extrinsic motivations.

The demographic data we collected in Table 1 showed that most online drivers are men, 77.3% (85 people), and the remaining 22.7% (25 people) are women. Meanwhile, in terms of age, the difference is too big. 17.3% (19 people) of online drivers are under 25 years old, while the majority are between 25–30 years old, 23.6% (26 people). The fewest are online drivers with an age range of 30–35 years as many as 16.4% (18 people). Online drivers aged 35–50 years as many as 18.1% (24 people), and those over 40 years as many as 20.9% (23 people).

Educational level data found that those who became online drivers not only completed high school level education, but some also had Bachelor's to Master's degrees. Online drivers who completed high school level education were 15.5% (16 people). The majority of online drivers have completed Diploma level education at 41.8% (46 people) and followed by Bachelor graduates at 40.9% (45 people). Meanwhile, online drivers with a Master's degree are at least 2.7% (3 people).

In terms of length of work, the majority are new online drivers who have worked for less than 3 years as much as 49.1% (54 people), while those who have worked for 3–5 years are 28.2% (31 people), and online drivers who those who have worked for more than 5 years are the least, namely 22.7% (25 people).

From this data, it shows that there are more male online drivers than females. Meanwhile, in terms of age, there are

not too big differences. Judging from the level of education, the majority of online drivers are Diploma graduates. Meanwhile, the length of work shows that the majority of online drivers have worked for less than 3 years.

This research combines interviews with existing quantitative research, using a mixed approach to deepen understanding of initial findings. After collecting quantitative data through surveys, researchers conducted in-depth interviews with several respondents to explore variables such as social values, participation engagement, and intrinsic and extrinsic motivations. The findings from these interviews were then analysed thematically and compared with quantitative data to provide a more comprehensive picture. Integrating the results from these two methods will allow researchers to gain deeper insights and support stronger conclusions in research reports.

Men predominantly occupy the online driver profession, representing 77.2%, reflecting common trends and possibly influenced by social norms and safety factors. The flexibility of working as an online driver appears attractive to various age groups. At the same time, the predominance of respondents with a Diploma and a Bachelor's degree education reflects the need for technological proficiency. Meanwhile, most drivers have a partnership duration of less than 3 years, which could indicate a high turnover rate or a new phenomenon in the industry.

Validity and reliability

The convergence validity test uses loading factor values for indicators against constructs. Research type determines limits: 0.7 for confirmatory, 0.6 for exploratory and 0.5 for development. The analysis shows that all indicators exceed 0.7 in both orders, meeting validity criteria and needing no exclusions.

Key definitions of variables

To answer the stated hypothesis, it is necessary to describe a number of variables used in this investigation, as indicated in Table 2.

The study describes research variables based on the perceptions of the respondents, analysed by calculating their mean scores. Mean scores are classified as low (1.00–2.33), medium (2.33–3.67) and high (3.67–5.00). The 'gamification of work (GW)' of this variable has an average score of 3.234, which falls in the reasonably good category. This indicates that most of the respondents believe that gamification in transportation provider platforms such as Gojek, Grab and Maxim is effective. However, the weakest aspect is indicator number 1, suggesting that elements such as star-based points need to be improved to optimise driver performance.

Analysis reveals that among the three indicators that measure social value in Gojek, Grab and Maxim, indicator 2 scores the lowest. This indicates that its gamification provides good

TABLE 3: Results of the direct effect test.

Path	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	*t*-statistics (|O or STDEV|)	*p*
GW -> KIN	0.41	0.41	0.09	4.630	0.000
GW -> MOT	0.80	0.81	0.04	26.29	0.000
GW -> SV	0.69	0.69	0.05	15.92	0.000
KP -> KIN	0.64	0.65	0.08	8.86	0.000
MOT -> KP	0.34	0.34	0.11	3.31	0.001
SV -> KP	0.16	0.16	0.09	1.98	0.049

GW, gamification of work; KIN, driver performance; MOT, motivation; SV, social value; KP, participation attachment.

TABLE 2: Key definitions of variables.

Variables	Code	Definition
Gamification of work	GW1	The addition of points in the form of stars makes it more exciting.
	GW2	The leaderboard listed on the application screen provides information on driver performance achievement.
	GW3	Using gamification applications to work like playing games.
	GW4	The gamification of work application provides a challenge to reach points in various alternatives.
Social value	SV1	Using the gamification of work application provides a learning experience.
	SV2	Using the gamification of work application to learn new things.
	SV3	Using the gamification of work application adds ongoing intention to add points (stars).
Driver motivation	ME1	Award
	ME2	Incentives can be received in sync with points and entered into the account.
	ME3	Competition
	MI1	Desire to get good points (5 stars)
	MI2	Using the gamification of work application gives freedom of expression at work.
	MI3	Point awards and additional scores are received automatically when the star value given is entered in the account.
	MI4	Incentives can be received in sync with points and entered into the account.
	MI5	The use of gamification of work makes driver performance appraisal more objective so that competition is healthier between drivers.
Participation attachment	KP1	Gamification of work provides new challenges in achieving additional points.
	KP2	Gamification of work makes enthusiasm because it is not boring.
	KP3	Gamification of work creates friendship among drivers because sharing is done with an objective assessment.
Driver performance	KIN1	Punctuality
	KIN2	Feedback
	KIN3	Activity cycle
	KIN4	Efficient

TABLE 4: Indirect effect test results.

Path	Original sample (O)	*t*-statistics (|O or STDEV|)	*p*
MOT -> KP -> KIN	0.22	3.41	0.000
GW -> MOT -> KP -> KIN	0.18	3.28	0.001
SV -> KP -> KIN	0.06	1.74	0.032
GW -> SV -> KP -> KIN	0.04	1.80	0.046
GW -> MOT -> KP	0.51	8.32	0.000
GW -> SV -> KP	0.11	1.70	0.046

GW, gamification of work; KIN, driver performance; MOT, motivation; SV, social value; KP, participation attachment; STDEV, standard deviation.

TABLE 5: A summary of hypothesis testing results.

No	Hypothesis	Result	Conclusion
1	There is an influence of gamification of work on social value.	0.69***	Accepted
2	There is an influence of gamification of work and motivation.	0.80***	Accepted
3	There is the influence of participation attachment social value.	0.16**	Accepted
4	There is a motivation and participation attachment.	0.34***	Accepted
5	There is an influence of gamification of work and driver performance.	0.41***	Accepted

, significance level 5%; *, significance level 1%.

social value to drivers, but needs enhancement, especially in areas such as learning experiences and social recognition. Online transportation drivers are more influenced by intrinsic motivation (average score 3.380) than by extrinsic motivation (3.245). Among the factors, rewards dominate extrinsic motivation, while incentives lead to intrinsic motivation. The participation attachment variable has an average score of 3.203, indicating that most drivers view gamification positively. This is mainly because of the new challenges gamification offers, such as the opportunity to earn extra points.

The average score for the driver performance variable is 3.361, falling into the 'pretty good' category. This suggests that most drivers perform efficiently, but improvements are still needed in their activity cycles.

Testing the effect of between variables

After ensuring the fit of the model in partial least square (PLS) analysis, tests can be performed on the relationships between variables. This includes testing direct, indirect and total effects. Using the bootstrapping method with 110 samples, the results will serve as a reference for testing direct effects between variables in the PLS model.

Discussion

Direct influence

In partial least square structural equation model (PLS SEM), direct effect measures the immediate impact of exogenous variables on endogenous variables, gauged by the *p*-value, *t*-statistic and the path coefficient. $p < 0.05$ and $t > 1.65$ indicate a significant effect, while $p > 0.05$ and $t < 1.65$ suggest no impact.

Table 3 shows us the result of the direct effect test between the variables. Table 3 stated that the *p*-value of gamification of work (GW) to driver performance is 0.000, meaning that gamification of work has a positive and significant effect on driver performance. The *p*-value between gamification of work to Motivation is 0.000, meaning that gamification of work significantly enhances motivation. The gamification of work and social value shows the *p*-value of 0.000, meaning that gamification of work has a significant positive effect on social value. The *p*-value between participation attachment and driver performance is 0.000, meaning that participation attachment significantly improves driver performance. Motivation also has significant positive effect on participation attachment, showed by *p*-value of 0.001. Meanwhile, social value has a significant but weaker effect on participation attachment showed by *p*-value = 0.049.

Overall, these results show that gamification not only directly improves driver performance (coefficient 0.407, $p < 0.001$) but also enhances it through increased motivation (coefficient 0.798, $p < 0.001$) and social value (coefficient 0.686, $p < 0.001$), which in turn enhances participation attachment (coefficient 0.638, $p < 0.001$). In other words, gamification creates a more interactive and supportive work environment, ultimately boosting driver performance and engagement. Motivation also has a significant impact on participation attachment (coefficient 0.336, $p = 0.001$), and social value influences participation attachment, although with a smaller effect (coefficient 0.157, $p = 0.049$).

All paths have *p*-values less than 0.05, indicating that the effects are statistically significant. The strongest effect is observed from GW to MOT, with a very high *t*-statistic (26.29). The largest effect size is from GW to MOT (0.80), indicating that GW is a strong predictor of motivation. The smallest effect size is from SV to KP (0.16), suggesting that social value has a smaller, yet significant influence on participation attachment.

Indirect influence

The indirect effect examines how exogenous variables influence endogenous variables through mediators. Its significance is determined by the *p*-value and the *t*-statistics, with $p < 0.05$ and $t > 1.65$ indicating mediation, and $p > 0.05$ and $t < 1.65$ suggesting that there is no mediating role.

Table 4 shows the indirect relationships and pathways through which gamification of work, motivation, social value, driver performance, and participation attachment are interconnected. MOT -> KP -> KIN has the *p*-value 0.000, meaning motivation has an indirect effect on driver performance through participation attachment and the effect is significant. GW -> MOT -> KP -> KIN has the *p*-value of 0.001, meaning of work indirectly affects driver performance through motivation and participation attachment. This path is significant. SV-> KP -> KIN *p*-value is 0.032, meaning social value has an indirect effect on driver performance through participation attachment. This effect is significant but weaker. GW -> SV -> KP -> KIN *p*-value is 0.046, meaning gamification

of work indirectly affects driver performance through social value and participation attachment. This path is significant but weaker. The p-value of GW-> MOT -> KP is 0.000, showing that gamification of work has an indirect effect on participation attachment through motivation. The effect is very strong and significant. The *p*-value of GW -> SV -> KP is 0.046. This shows that gamification of work indirectly affects participation attachment through social value. This path is significant but weaker.

Overall, these results show that gamification not only directly improves driver performance (coefficient 0.407, $p < 0.001$) but also enhances it through increased motivation (coefficient 0.798, $p < 0.001$) and social value (coefficient 0.686, $p < 0.001$), which in turn boosts participation attachment (coefficient 0.638, $p < 0.001$). Gamification creates a more interactive and supportive work environment, ultimately enhancing driver performance and engagement. Motivation significantly impacts participation attachment (coefficient 0.336, $p = 0.001$), and social value influences it to a lesser extent (coefficient 0.157, $p = 0.049$). Indirectly, motivation and social value impact performance through participation attachment (coefficients 0.214, 0.053; $p < 0.05$).

All paths from Table 4 have *p*-values less than 0.05, indicating that the indirect effects are statistically significant. The strongest indirect effect is observed from GW to MOT to KP, with a very high *t*-statistic (8.32). The largest indirect effect size is from GW to MOT to KP (0.51), indicating that gamification of work is a strong predictor of participation attachment through motivation. The smallest indirect effect size is from GW to SV to KP (0.04), suggesting that gamification of work has a smaller yet significant influence on driver performance through social value and participation attachment.

The study highlights that gamification indirectly affects driver performance, mediated by motivation, participation attachment and social values. With an adjusted R square value of 0.456, 45.6% of driver performance variance is influenced by participation attachment and gamification, while 54.4% is affected by other external factors.

Hypothesis test

Hypothesis testing was carried out in this study based on the results of the PLS SEM analysis. The following is a summary of the results of testing the hypothesis in this study:

The effect of gamification of work on social value

Based on the results of the analysis in this study, it was found that GW had a positive and significant effect on SV, indicated by a *p*-value of 0.000 and a *t*-statistic of 15.910 with a positive path coefficient of 0.686. This means that the more gamification is used in online transportation provider companies such as Gojek, Grab and Maxim, the higher the company's social value in driver perception. And vice versa, without gamification or gamification in online transportation service companies, the company's social value in the driver's perception is also low. Several previous studies have examined the use of game rules in non-gaming environments, such as in education and companies. The results of this study are in line with the results of the research (Hamari & Koivisto, 2015).

Perceived value, defined as a consumer's assessment of a product's usefulness based on their perceptions, influences behaviour such as satisfaction, usage intention and brand loyalty. In online transportation services, gamification boosts this value by offering rewards and benefits, leading to a higher appraisal of the service used. In driver performance assessment with gamification, it is hoped that the perceived value of online transportation will increase so that it will increase consumer behaviour such as satisfaction levels, intention to return to use and user loyalty.

This study confirmed that gamification significantly boosts the motivation of online transportation service users, as evidenced by a *p*-value of 0.000 and a *t*-statistic of 26.283. The positive path coefficient of 0.798 suggests that increased gamification in these companies increases driver motivation, whereas its absence could lead to diminished motivation because of a lack of challenges and rewards. The results of this study are in line with the results of research (Faust, 2021). This shows that there is an effect of gamification on motivation and the difference is that in this journal, gamification is applied in the world of education. The results of this study are also in line with the results of Sebastian's research (Deterding, 2011), which shows an increase in consumer motivation to use products after the application of gamification.

The effect of social value on participation attachment

The analysis shows that social values positively influence participation attachment, with a *p*-value of 0.049, a *t*-statistic of 1.975 and a path coefficient of 0.157. Essentially, when drivers perceive higher social values from online transportation companies, their attachment to participation increases; the opposite is true for lower perceived social values. This aligns with the findings of Deterding et al. (2011).

The results of this study indicate that driver work motivation has a positive and significant effect on participation attachment, indicated by a *p*-value of 0.001 and a *t*-statistic of 3.309 with a positive path coefficient of 0.336. This means that the higher the online transportation driver's motivation, the higher the driver's participation attachment, and conversely, the lower the driver's motivation, the lower the driver's participation attachment. Gamification is one of the company's strategies that aims to increase employee motivation and engagement. With gamification, workers will be increasingly challenged and try to get rewards so that workers' participation attachment is even higher.

The direct effect test revealed that gamification positively influences driver performance, as evidenced by its *p*-value of 0.000, *t*-statistic of 4.620 and a path coefficient of 0.407, especially in transportation provider companies such as Gojek, Grab and Maxim. Similarly, gamification found that it improves employee performance and motivation, leading them to achieve better results in pursuit of rewards and benefits.

Gamification significantly boosts the motivation of users of online transportation services; increased implementation in such companies increases driver motivation. Conversely, without gamification, driver motivation diminishes because of a lack of rewards and challenges (Hanus & Fox, 2015). The increased perceptions of the social value of online transportation companies among drivers correlate with a higher attachment to participation, while a lower social value can decrease this attachment.

Conclusion

The study emphasises the significant beneficial influence of gamification on the performance of online transportation drivers, highlighting the critical role of social values, motivation and active participation in mediating improved outcomes. The findings provide practical information for businesses and organisations, implying that gamification tactics might increase employee engagement, productivity and performance while building a cooperative and supportive work environment. However, the study's limitations stem from a lack of comprehensive enquiry into broad social and humanistic elements, and further research is required to go deeper into understanding the multiple consequences of gamification in the contexts of organisations, beyond simply performance measurements.

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Authors' contributions

H.R.D.P. contributed towards the conceptualisation, methodology, analysis investigation and writing of this research article. R.R., A.A.S. and D.D. analysed, investigated and assisted with the writing of this research article.

Ethical considerations

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Data availability

Data sharing is not applicable to this article as no new data were created or analysed in this study.

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