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Yingying Chen
City University of Hong Kong, ychen535-c@my.cityu.edu.hk

Alvin Leung
City University of Hong Kong, acmleung@cityu.edu.hk

Wei Thoo Yue
City University of Hong Kong, wei.t.yue@cityu.edu.hk

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Short Paper

Yingying Chen
City University of Hong Kong
Kowloon, Hong Kong
ychen535-c@my.cityu.edu.hk

Alvin Chung Man Leung
City University of Hong Kong
Kowloon, Hong Kong
acmleung@cityu.edu.hk

Wei Thoo Yue
City University of Hong Kong
Kowloon, Hong Kong
Wei.T.Yue@cityu.edu.hk

Abstract

To motivate user engagement and generate desired engagement outcomes, some social trading platforms have introduced gamified systems with hierarchical badges and financial incentives. However, previous studies have not examined the effectiveness of such an application. Based on data collected from a popular social trading platform, eToro, we empirically examine the effectiveness of the gamified system and its mechanism. Results indicate that the gamified system under social trading is effective in inducing user-to-user and user-to-system interactions, thus leading to some desired engagement outcomes on social media. However, the gamified system does not contribute to the engagement outcomes on financial investment. Our paper contributes to the literature on both gamification and social trading, highlighting gamification's important practical implications for platform managers, cautioning against the possible ineffectiveness of the dual-outcome gamified system and shedding light on the design of gamified systems.

Keywords: Gamification, Social Trading, User Engagement

Introduction

Social trading refers to the process in which followers copy real-time financial trades made by expert traders on a platform, where real-time financial trade information is posted, allowing social networks to be built. Social trading platforms generate revenues from commission fees and management fees on copy trading. The popularity of social trading has increased dramatically in recent times, contributing to increasingly fierce competition between platforms. Social trading platforms must thus address an important issue: how can they retain expert traders and motivate them to contribute more to the platform?

The most fundamental way of solving this issue is to offer rewards, both intrinsic and extrinsic, to expert traders. However, given the mature market, there is limited room for a platform to manipulate extrinsic rewards because there is already an established fair price for expert users' contributions. Thus, one possible solution is to utilize extrinsic rewards while also fostering an intrinsic motivation for users' recurring interactions (Liu et al. 2017); this can be accomplished by a gamified system (Thiebes et al. 2014).

Gamification means applying game elements to a non-game context (Deterding et al. 2011). By combining the intrinsic and extrinsic rewards, a gamified system can help motivate users to engage more; this has been

demonstrated in scenarios such as knowledge exchange (Goes et al. 2016), technology-mediated learning (Leung et al. 2022), and online weight-loss community (Bojd et al. 2022). Some popular social trading platforms, such as eToro, have also adopt gamified systems to incentivize expert traders to contribute their trading strategies.

However, as the adoption of a gamified system under social trading is a relatively new phenomenon in business, there remains a gap in our understanding regarding the effectiveness of gamified systems. Specifically, such a phenomenon differs from the traditional gamification application from the following two ways. Firstly, the desired engagement outcomes in scenarios involving social trading are twofold rather than singular, which is different from former studies. For example, in the online knowledge exchange scenario studied by Goes et al. (2016), the primary goal of the gamified system is centered on users' knowledge contribution. In online learning (Leung et al. 2022), the desired engagement outcome is to learn well. However, in the context of social trading, both financial investment performance and social media content richness matter in attracting the asset under management (AUM) provided by the copiers, which is the platform's primary source of revenue. On one hand, the high investment return entices newcomers and bolster existing users' faith in the platform's expert traders' management skills. On the other hand, the content richness on social media helps expand expert traders' social networks, which attracts monetary flow. Therefore, although the general goal of motivating user engagement is similar in many contexts, it remains unknown whether a gamified system is effective under social trading. Secondly, the user engagement outcomes are highly related to social interaction on social networks. For the online weight-loss community and technology-mediated learning scenarios, the engagement outcome is mainly concerned with the users' own efforts rather than social interactions. For social trading, social interaction plays an important role in the self-promotion of the expert traders and mitigate the information asymmetry, thus contributing to an increase in the AUM.

For these two reasons, we cannot conclude that the gamified system is effective based on the current literature. Currently, the gamified system is employed on popular some social trading platforms and its application may have significant business value. Therefore, it is prudent and timely to investigate the effectiveness of gamification in social trading. This study can not only contribute to the literature on gamification and social trading but also provides some valuable implications to relevant practitioners. If we find that the gamified system cannot perfectly handle the dual outcomes, our study will gain the attention of related industries and lead to further exploration on how to better motivate users via a dual-outcome-oriented gamified system.

In this study, we investigate the popular social trading platform, eToro, where the potential copiers (*copiers*) can copy the real-time financial trades of one or more expert traders by investing an amount of AUM. Expert trader selection is dependent on the experts' trading history and the postings on their personal pages. Once an expert trader has satisfied some requirements (e.g., accumulating sufficient AUM, etc.), they will either receive an initial badge as *Cadet* or their current badge will be upgraded to the next higher level. Note that when expert traders have attained badges, they are considered to be popular investors (PI) in the Popular Investor Program (PIP). Drawing upon the theoretical diagram proposed by Liu et al. (2017), we aim to examine the effectiveness of the gamified system on (1) user-system interactions, and (2) engagement outcomes.

We collected the full records of 864 PIs and 864 non-PIs from March 2021 to October 2021 to investigate the effectiveness of the gamified system. We found that the gamified system significantly induces user-to-user and user-to-system interaction. However, it cannot lead to dual outcomes concerning the two kinds of interactions simultaneously—only its effectiveness on user-to-user interaction-related outcomes is significant.

Our study is one of the first to empirically investigate the effectiveness of gamified system on social trading platforms. Our findings not only verify the value of gamified system adoption on social trading platforms but also raise the issue that the gamified system may not be effective in all desired aspects, especially when there exist dual outcomes desired by the platform. These findings contribute to the literature on gamification and social trading and offer important implications to practitioners regarding the challenges of designing a dual-outcome-oriented gamified system.

Literature Review

Gamification

Due to the rapid digitalization of the modern era, an individual's attention can be easily distracted by the digital information regardless of time or place. Consequently, classic models of engagement may no longer be appropriate (Zichermann and Linder 2013). Gamification has the potential to hold and retain users' attention. Recent studies have demonstrated the effectiveness of the gamified system in the context of online knowledge exchange (Goes et al. 2016), technology-mediated learning (Leung et al. 2022), and the online weight-loss community (Bojd et al. 2022). However, few studies have explored gamified systems in the context of social trading. Several social trading platforms have already adopted gamified systems, yet their effectiveness remains empirically unknown. As competition in the social trading business is becoming increasingly fierce and the gamified system is a potential strategy to motivate user engagement, it is imperative to study the effectiveness and mechanism of gamification implementation in social trading.

Badge-based gamified systems are one of the most popular approaches to gamification implementation. Badges are symbols that represent rewards for the users of the gamified platform. The attainment of badges can either serve as an intrinsic reward, e.g., by providing the user with a sense of accomplishment, or an extrinsic reward, such as a monetary bonus associated with earning a specific badge. For the former scenario, related studies on knowledge exchange (Goes et al. 2016) and bike commuting (Sheffler et al. 2020) provide empirical support that the intrinsic reward-related badge system can significantly motivate users to increase engagement However, few studies have empirically investigated the effectiveness of a badge system dominated by extrinsic rewards, which is the main type of gamified system in scenarios such as social trading.

We contribute to the literature on gamified systems by adding the context of social trading and empirically investigating the effectiveness of gamified system on user interactions and engagement outcomes.

Social Trading

Social trading is a popular online approach merging financial investment, the wisdom of the crowd, and social media (Brand 2017). Using a social trading platform, a follower can copy the real-time financial trades of an expert trader and realize the same return by paying a set commission fee to the related platform. Apart from the financial incentive, the platform may implement other strategies (e.g., the gamified system) to enhance social trading engagement for expert traders. However, few papers have documented such scenarios and the effect of the gamified systems on social trading remains unknown.

Most published papers on social trading have focused on social trading mechanisms from a financial aspect, such as investment performance and fund flows, as well as financial behaviors, such as risk attitudes (Apesteguia et al. 2020), trading frequency (Jin et al. 2019), and the disposition effect (Heimer 2016). Only a few studies have focused on the relationship between social media and social trading (Ammann and Schaub 2021). However, in business, both the level of financial investment and the content on platform-embedded social media contribute to the success of a social trading platform. In our paper, we empirically study the gamified system's effect with respect to financial investment and social media in the social context scenario.

In sum, we contribute to the literature on social trading by investigating the effect of the gamified systems from the dual perspectives of financial investment and social media content.

Hypothesis Development

Here, we considered a badge system with two main types of interactions: user-to-user interactions and user-to-system interactions, which lead to social media-related and financial investment-related outcomes, respectively. For clarity, we refer to the users of the gamified system who do not copy others' trades and possess investment expertise as expert users, who have the potential to be PIs. In addition, we define users who never join the PI program and copy others users' trades in real-time as copiers. We consider the influence of the gamified system on interaction and engagement outcomes; our conceptual diagram is depicted in Figure 1.

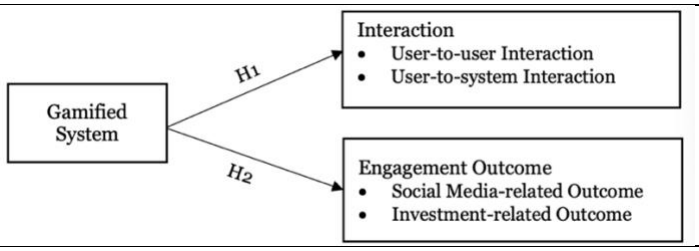

Figure1. Gamified system in the context of social trading

Interaction

Interactions in the context of gamification studies refer to the dynamics and user behaviors that are induced by the gamified element (Liu et al. 2017). Examples of gamified elements include symbols, rewards, or badges with rewards. Even trivial symbols can affect people's behaviors (Anderson et al. 2015). Therefore, driven by the desire to obtain senior badges, a user would presumably try to be more active in the business system. Furthermore, according to "goal gradient" in psychology literature (Heath et al. 1999, Kivetz et al. 2006), if the gamified system is effective, the behavioral effects induced by the system are amplified as users approach their goal (e.g., their desired badge).

In the context of social trading, the conditions to upgrade badges are closely related to the popularity of a user, which is typically determined by the user's AUM and the number of copiers that follow tht user. Correspondingly, there are two primary ways in which a user can gain popularity: social media engagement (e.g., spontaneous sharing and providing feedback to fans) and the financial investment (e.g., timely improvement of investment strategies to adjust to market changes, etc.). Drawing on the framework of Liu et al. (2017), we refer the two paths aforementioned as user-to-user interaction and user-to-system interaction. As the goal of this study focuses on the behavioral outcomes (change in interaction) and the engagement outcomes which are related to the goal of the platform, system-to-user interaction is not included. As they approach a badge upgrade, users may potentially interact more frequently with other users on social media while also trading more frequently on the financial trading system, motivated by the promise of an upgraded badge. Hence, our first hypothesis is as follows:

HYPOTHESIS 1. *The gamified system has a positive influence on (a) user-to-user interaction and (b) user-to-system interaction.*

Engagement Outcomes

While interaction is essential for an effective gamified system, a meaningful engagement outcome is the most critical output for the platform. Engagement outcome can be analyzed at both the individual level and group levels (Liu et al. 2017), which can differ due to variability in the goals of the two parties.

In badge systems with embedded rewards, the overarching goal of an individual participant is to obtain the reward associated with the badge. In social trading, badge upgrade criteria are primarily focused on the user's popularity, comprising aspects of social media engagement and financial investment performance. In contrast, platforms are interested in strong individual performances, including the quality of rich content on social media and positive investment returns, which help the platform attract AUM.

The effectiveness of gamification has been proven in multiple scenarios, such as technology-mediated learning (Leung et al. 2022), online weight-loss communities (Bojd et al. 2022), online knowledge exchange (Goes et al. 2016), and bike commuting (Sheffler et al. 2020). Likewise, we expect that the gamified system under social trading can lead to improved engagement outcomes for both individuals and the platform. Thus, we make the following hypotheses:

HYPOTHESIS 2. *The gamified system has a positive influence on engagement outcomes for both individuals and the platform.*

HYPOTHESIS 2a. *The gamified system has a positive influence on social media-related engagement outcomes for individuals.*

HYPOTHESIS 2b. *The gamified system has a positive influence on financial investment-related engagement outcomes for individuals.*
HYPOTHESIS 2c. *The gamified system has a positive influence on social media-related engagement outcomes for the platform.*
HYPOTHESIS 2d. *The gamified system has a positive influence on financial investment-related engagement outcomes for the platform.*

Research Context

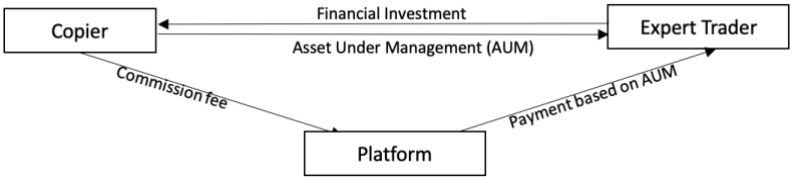

Figure 2. The three main parties on a social trading platform

eToro is a well-known online social trading platform founded in 2007 that has a featured badge-based gamified system (PIP). On eToro, there are two main functions as a financial trading system and social media, such two-function dominating scenario makes social trading a different scenario from the traditional ones. For the former, the monetary relationship between the three main parties—the copiers, expert traders, and platforms—is illustrated in Figure 2. When copiers decide to follow the real time financial investments of expert traders, they provide the expert traders with AUM while simultaneously paying a commission fee to the platform. A portion of the fee goes to the expert trader being followed.

For platform-embedded social media, both copiers and expert traders can post messages and interact with each other. Specifically, the "Feed" channel on the user page has information regarding the user's posting history, comments, etc. Interactions on this portion of the platform are similar to traditional social media, with features such as commenting on other users' posts and the ability to reply to comments.

In the gamified system, the focal party is the expert trader, which includes two groups of people: those who own a badge and those who may have the potential to win a badge. Briefly, there are a total of four levels in the PIP: "Cadet", "Champion", "Elite", and "Elite Pro". The ratio of payment to AUM differs for each level. To upgrade to a higher level, a user has to possess a certain amount of copiers, complete a certain tenure period, maintain a medium level of risk, and reach a minimum AUM and equity investment threshold. A user can only obtain their badge upgrade when all conditions are satisfied.

Data and Methodology

Data

The data used in this study were scraped from the public eToro web pages between March and October 2021. During this period, we collected the full daily records of 864 PIs and 864 non-PIs and the sample of user is selected via propensity score matching.

Dependent Variables

There are two primary categories of interest: user-system interactions and engagement outcomes. We measure users' interactions with others by their daily number of postings that a user posts (*NumPostings*), and we measure user-to-system interactions by their daily number of financial trades (*NumTrades*).

Engagement outcomes relating to social media and financial investment were considered for both users and the platforms. In terms of social media-related outcomes, the main target for a user is to gain popularity on the social media; this can be measured by the number of likes that a focal user receives daily (*NumLikesReceived*). For the platform, the information richness embedded in a user's postings (*InformationRichness*) is important; this is measured as the average number of concepts per posting during a day, calculated according to Goh et al. (2013).

For financial investment-related engagement outcomes, the number of incremental copiers per day (*IncrementalCopiers*) was considered as the engagement outcome for an individual and the market-adjusted return, also known as Capital Asset Pricing Model (CAPM) Alpha (*InvestmentReturn*) was considered as the engagement outcome for the platform. We used SP500 index from Yahoo! Finance as the baseline for *InvestmentReturn* as a broad US equity market return can be used as a baseline in CAPM-like asset pricing models (Lettau et al. 2014). *InvestmentReturn* was calculated based on Barber et al. (2016).

Independent Variables and Other Variables

Our independent variable should adequately capture an individual's motivation to gain badges and the associated rewards. According to expectancy theory, an individual can be motivated to behave in certain ways given their expectancy of goal achievement (i.e., how likely they are to realize the desired outcome) and the value of the desired outcome as judged by the individual. Compared to the latter, the goal achievement likelihood is more objective and was used as the main independent variable. This was expressed as the distance to upgrade (*Distance*); a similar measure was adopted by Goes et al. (2016).

To measure expert traders' distance from the upgrade threshold, we took the difference between the users' current achievements and the achievements required to upgrade badges across multiple related dimensions using Equation (1), where *i* refers to the dimension and has a value of 1–4. Multiple dimensions were then aggregated using Equation (2). The major upgrade requirements for individuals are listed in Table 1. Note that a user can only be promoted to the next level when all four conditions in Table 1 are fully satisfied.

	Duration of trading at the current level (D1)	Equity Invested (D2)	Number of Copiers (D3)	Average AUM (D4)
Non-PI→Cadet	More than 2 months	>=$1000	>=1	>=$500
Cadet→Champion	More than 2 months	>=$5000	>=10	>=$50000
Champion→Elite	More than 4 months	>=$25000	>=10	>=$500000
Elite→ElitePro	More than 2 months	>=$50000	>=10	>=$10000000

Table 1. Upgrade requirements of the badge system

$$Distance_{Di} = \begin{cases} \max\left(1 - \frac{Current\ Achievement}{Upgrade\ Threshold}, 0\right), if\ a\ user\ has\ never\ been\ at\ the\ next\ higher\ level \\ 0, otherwise \end{cases} \quad (1)$$

$$Distance = 1 - (1 - Distance_{D1})(1 - Distance_{D2})(1 - Distance_{D3})(1 - Distance_{D4}) \quad (2)$$

Finally, we used each user's percentage of active weeks (*ActiveWeeksPct*), number of weeks since registration (*WeeksSinceRegistration*), percentage of high leverage trades (*HighLeveragePct*), and financial trading risk score as assessed by the platform (*RiskScore*) as control variables.

Models

The basic models described in this section are fixed effect models based on panel data. Since user-to-user interactions and their related outcomes have little to do with a user's risk level, we did not include risk attitude-related control variables, such as *HighLeveragePct* and *RiskScore*, in the related regressions.

To test H1, we employed the following fixed effect models:

$$y_{i,t+1} = \beta_1 Distance_{it} + \gamma_1 ActiveWeeksPct_{it} + \gamma_2 WeeksSinceRegistration_{it} + \alpha_i + \theta_t + \varepsilon_{it} \quad (3)$$

$$y_{i,t+1} = \beta_1 Distance_{it} + \gamma_1 ActiveWeeksPct_{it} + \gamma_2 WeeksSinceRegistration_{it} + \gamma_3 HighLeveragePct_{it} + \gamma_4 RiskScore_{it} + \alpha_i + \theta_t + \varepsilon_{it} \quad (4)$$

In Equation (3), the dependent variable $y_{i,t+1}$ represents user-to-user interaction that is one period ahead, which is $NumPostings_{i,t+1}$. Here, one period is equal to one day. In Equation (4), $y_{i,t+1}$ captures the one-period-ahead user-to-system interactions, which is $NumTrades_{it+1}$. In Equations (3) and (4), β_1 is the coefficient of the independent variable $Distance_{it}$. The significance of coefficient β_1 indicates whether the gamified system has a significant impact on user-system interactions, and its sign indicates whether the

gamified system strengthens (positive sign) or weakens (negative sign) the interactions. α_i refers the user-specific fixed effects, θ_t refers to time-specific fixed effect, and ε_{it} is the error term.

To test H2, we used the following fixed effect models:

$$y_{i,t+1} = \beta_1 Distance_{it} + \gamma_1 ActiveWeeksPct_{it} + \gamma_2 WeeksSinceRegistration_{it} + \alpha_i + \theta_t + \varepsilon_{it} \quad (5)$$

$$y_{i,t+1} = \beta_1 Distance_{it} + \gamma_1 ActiveWeeksPct_{it} + \gamma_2 WeeksSinceRegistration_{it} + \gamma_3 HighLeveragePct_{it} + \gamma_4 RiskScore_{it} + \alpha_i + \theta_t + \varepsilon_{it} \quad (6)$$

In the model described by Equation (5), $y_{i,t+1}$ represents the one-period-ahead engagement outcomes of user-to-user interactions, which are expressed as the popularity of a user on the eToro-embedded social media platform ($NumLikesReceived_{i,t+1}$) for the individual user and the content richness ($InformationRichness_{i,t+1}$) for the platform. In Equation (6), $y_{i,t+1}$ represents the one-period-ahead engagement outcomes of user-to-system interactions. For the individual, this is expressed by how popular the expert user is in terms of copiers ($IncrementalCopiers_{i,t+1}$) and how well the trader performs financially ($InvestmentReturn_{i,t+1}$). In Equations (5) and (6), α_i and θ_t are the user- and time-specific fixed effects, respectively, and ε_{it} is the error term.

Preliminary Results

The Effect of a Gamified System on User-System Interactions

Columns (1) and (2) in Table 2 show the effects of gamification on user-system interactions. Specifically, the coefficient of *Distance* estimates the effect that the "distance to upgrade" within the gamified system has on user-system interactions. If the coefficient is negative, then user accelerates their efforts when approaching the upgrade goal, which indicates that the gamified system has a positive influence.

In Column (1), the coefficient of *Distance* is -0.0333 (p<0.01), which is negative and statistically significant at the 0.01 level. This suggests that when a user is closer to upgrading, they post more frequently on social media, indicating that H1a is supported. Next, based on Column (2), we find that a user would trade significantly (p<0.01) more frequently when approaching an upgrade, suggesting that H1b is supported.

Our analysis of user-system interactions thus demonstrates that the gamified system has a positive influence on both user-to-user and user-to-system interactions. Therefore, Hypothesis 1 is fully supported.

The Effect of a Gamified System on Engagement Outcomes

The results on engagement outcomes-related models are presented in Column (3) - (6) in Table 2. Note that due to the limited availability of data on certain users' trade history, not all users have complete *InvestmentReturn* data.

The primary goal of individuals is to become more popular and receive badge upgrades. Column (3) shows that when a user is closer to upgrading, they receive significantly (p<0.05) more likes on their posts, indicating that H2a is supported. Next, Column (4) shows that the gamified system had no significant effect on the incremental number of copiers they gained per day (p>0.10), suggesting that H2b is not supported.

Platforms are more interested in the richness of information found in financial discussions as well as the number of high-return financial trades. Column (5) shows that the *Distance* has a coefficient of -0.0077, at the 0.05 significance level,indicating that as a user gets closer to upgrading, the information richness embedded in their posts increases, which supports H2c. However, Column (6) shows that the coefficient of *Distance* as 0.1112 of no significance at 0.10 level reveals that there is no significant effect of *Distance* on the individual investment performance. Accordingly, H2d is not supported.

To sum up, H2a and H2c were supported, suggesting that the gamified system was effective at achieving the desired user-to-user engagement outcome for both the individuals and platforms.

	User-system Interaction		Engagement Outcomes			
	NumPostings	NumTrades	NumLikesReceived	IncrementalCopiers	InfomationRichness	InvestmentReturn
	(1)	(2)	(3)	(4)	(5)	(6)
Distance	-0.0340** (0.0048)	-0.5167** (0.0384)	-0.3190† (0.1840)	-0.0545 (0.0783)	-0.0077* (0.0030)	0.1112 (0.1019)
ActiveWeeksPct	-0.0015** (0.0001)	-0.0097** (0.0008)	-0.0183** (0.0039)	0.0028† (0.0017)	0.0000 (0.0001)	0.0059 (0.0058)
WeeksSinceRegistration	0.0038† (0.0021)	0.1225** (0.0172)	0.0222 (0.0827)	0.0194 (0.0352)	-0.0001 (0.0014)	-0.0988† (0.0472)
HighLeveragePct		-0.0087* (0.0035)		0.0032 (0.0072)		0.0147 (0.0109)
RiskScore		0.0283** (0.0066)		-0.0228† (0.0135)		0.0727** (0.0222)
User Fixed Effects	Y	Y	Y	Y	Y	Y
Time Fixed Effects	Y	Y	Y	Y	Y	Y
No. of users	1728	1728	1728	1728	1728	1126
No. of time units	199	199	199	199	180	178
R^2	0.0008	0.0011	0.0000	0.0000	0.0000	0.0001

Notes: The dependent variable is the lead variable with a lead time of one day.
†Significant at 0.1; *significant at 0.05; **significant at 0.001.Robust standard errors in parentheses.

Table 2. Estimation of panel models

Discussion and Conclusion

The study demonstrates the effectiveness of the badge-based gamified system under social trading on user-to-user interactions and user-to-system interactions, as well as the engagement outcomes based on data from eToro. We find that under the gamified system, users were more active in terms of interactions as they approached the upgrade, increasing the information richness in their posts and becoming more popular on social media. However, no significant effects were found on their financial performance.

Our results are consistent with previous studies in terms of the partial ineffectiveness of the gamified system despite its effectiveness on user effort. Like Santhanam et al. (2016), we demonstrate that it was difficult to realize engagement and the desired engagement outcomes simultaneously under social trading. One possible explanation is that the investment performance is rife with uncertainty; hence, its effect on investment-related outcomes may be a separate issue from the impact of user-system interactions. One possible solution is to incorporate more user-specific characteristics in the gamified system, which can be further explored in future research. In addition, our results on the incremental user effort as the distance to upgrade decreases in the badge-based system are consistent with Goes et al, (2016), demonstrating the effectiveness of the gamification system.

Our study contributes to the gamification literature by adding social trading context and offers valuable insights to the social trading literature on the adoption of gamification. Specifically, most gamification studies have focused on education and health; thus, the effectiveness of gamification on social trading context remains vague. To our knowledge, we are one of the first studies to evaluate the merits of gamified system applied tounder social trading. Then, this study adds to the social trading literature by revealing the effectiveness of gamified system on both interactions and the information richness on social media. Practically, we show that there is no one-size-fits-all gamification design under social trading, and caution administrators that gamification cannot work for all outcomes. Particularly, when pursuing mixed goals, managers can develop more than one gamified system to induce people's engagement. For tasks as complex as financial investment, an amount of work is needed to design the system.

Finally, we have to address the fact that this short paper only considers part of user-system interactions and does not explore the relationship between the user-system interaction and the engagement outcomes. Future work will include a more concrete theoretical model and more measurement items to capture the outcomes of gamified system.

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