



Gamifying Consumer Engagement: The Role of Online Community Interaction in Shaping Blind Box Purchase Behaviour in China

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ABSTRACT

As the blind box market grow beyond toys into more diverse areas including fashion, cosmetics, and even food, it has become increasingly important to understand the mechanisms driving its success. One key observation is that blind box consumption is highly socially motivated whereby many of the customers join online blind box communities to interact with others along their consumption journey. As such, this study focuses on the online blind box community in China, examining how gamification elements namely reward structures, perceived scarcity, user engagement, visual aesthetics, brand storytelling, and user experience influence blind box purchase behaviour. It is hypothesized that these relationships are amplified by online community interaction. A quantitative online survey of 436 blind box consumers in China revealed that all gamification elements significantly predict purchasing behaviour, but the effects are significantly strengthened by online community interactions. The study highlights the pivotal role of online community interactions in strengthening the blind box marketing model. Theoretically, the study explains that community-driven engagements and gamification jointly contribute to driving the consumption of blind boxes. This study offers practical insights on how to create online community strategies and interactive content to enhance loyalty and create more immersive consumer experiences.

Keywords: Blind box; gamification; online community; purchase behaviour; digital marketing.

1. INTRODUCTION

Blind box is a retailing concept whereby purchases are made without knowing the content of the box. Blind boxes feature the same outer packaging, but the content is a surprise to the purchaser. Although popularly used in marketing trendy toys, the blind box concept has now extended beyond selling toys. For example, several apparel brands have introduced "mystery boxes," where customers purchase clothing or accessories without knowing the exact items they will receive. In the food industry, restaurants and delivery services have experimented with blind box-style mystery meals, where customers order meals without knowing the exact contents. Brands that offer blind boxes have successfully

leveraged the concept to create strong market presence (Cao, 2024).

The excitement and anticipation of discovering what is inside make blind boxes particularly appealing (Li & Choi, 2023). Purchasing blind boxes becomes a game of chasing elusive items as well as competing with others in getting those items. Central to the blind box model are the gamification elements including reward systems, item scarcity, active user engagement, and appealing visual designs that are seamlessly integrated to create an immersive play-purchase experience and subsequently, drive consumer loyalty. Initially, rewards systems were the key element utilized to encourage consumer engagement in blind

boxes. The systems are built on point-based programs that let consumers earn points with each purchase that can later be redeemed for exclusive items or discounts. The reward systems mimic those in video games that encourage consumers to aim for the highest points. Moreover, consumers are often given unexpected rewards which further drive their excitement. Today, however, the reward in playing blind boxing extend beyond chasing reward points and obtaining rare items, as consumers increasingly use blind boxes as a means of gaining social currency within the blind box community.

In China, where purchasing blind boxes is a social norm among the young adults, online communities has fueled its further growth. These large-scale online communities include official brand communities, secondary trading platforms, interest-based groups, and fan communities on social media (Tong, 2022). Consumers use these platforms to share their unboxing experience, show off their recent purchases, trade with others, or to discuss their favourite series. As such, these online communities play a pivotal role not only in enhancing consumer interactions but also boost market engagement (Liu et al., 2023; Zhang, 2023). These interactions allow consumers to include the blind box brands into their social world and strengthen the brand loyalty, which consequently not only drive them to repeat purchase but also endorse the brand to others.

The growth of online blind box communities has contributed towards turning the blind box consumption from simple purchasing activity into a social phenomenon where consumers actively interact with like-minded others (Loi & Wong, 2023). Joining these communities allows the consumers to participate in interactive events such as online polls or games and use that as opportunities to express their thoughts on feelings about their favourite brands to others. The online communities often host trading events that help consumers to exchange items that they no longer desire or find items that are missing from their collection. Adding to the excitement in joining these online communities are the live-streamed unboxing events that turn purchases into memorable shared social experiences.

The online community interactions therefore have become central in the consumption

experience of many blind box consumers. Despite this, the role that these interactions play in the overall mechanics of blind box consumption has yet to be fully explained. As such, the present study seeks to investigate the moderating role of online community interaction on the relationship between the gamification mechanics and blind box purchase behaviour.

2. REVIEW OF LITERATURE

2.1 Blind Box and Gamification

Blind boxes, generally defined as surprise collectible products, have gained significant market interest worldwide, particularly among young consumers. Specifically designed to evoke curiosity and excitement, blind boxes often trigger impulsive purchases. Consumers are attracted to the element of uncertainty and the sense of anticipation linked to the purchase of blind boxes, driving them to make repeated purchases in search of their desired items (Chen et al., 2020). Past studies have demonstrated that the element of surprise and the perceived scarcity of blind box items increase the perceived value of the products, which in turn motivates consumers to continue engaging with the brand and make additional purchases (Lee, Wyllie, & Brennan, 2025). As a socially driven consumption, blind box purchasing is also closely linked to the concept of “FOMO” (Fear of Missing Out), whereby consumers make purchases to avoid the feeling of missing out on exclusive or limited items (Prentice, 2019).

The consumption of blind boxes has often been described as resembling gameplay as it incorporates elements of uncertainty, anticipation, challenge and reward that are commonly associated with games. In this study, gamification is used as a lens for understanding blind box consumption. Gamification refers to the application of game-like elements in non-game contexts and has been found to influence consumer behaviour in the context of e-commerce (Khatri, Saxena, Nandini, Khan, & Alaskar, 2024). Game mechanics such as rewards, achievements, and progress tracking enhance user engagement, motivate consumption, and increase purchasing intentions. In blind boxes, these elements provide a sense anticipation and excitement that can drive impulsive purchase behaviours (Mulcahy et al., 2021).

The integration of game-like elements in consumption taps into intrinsic motivational drivers, such as competitiveness, social comparison, and need for achievement, thus encouraging repeat purchases and foster loyalty. Moreover, for blind boxes, the surprise element from each purchase event appeals to consumers' craving for novelty and excitement, thereby encouraging the consumer to come back for more (Mason et al., 2021).

2.2 Online Communities in Blind Box Consumption

Blind box online communities serve as social platforms where consumers network, exchange information, share experiences and subsequently influence one another's perceptions and decision making (Jin & Ryu, 2020). Consumers often rely on their peers in these communities for recommendations, validation, and emotional support (Huang, 2024). Such interactions also enhance the effects of gamification as consumers become motivated to compete with others, gain social recognition and showcase achievements within the community (Zhang, 2024). Consequently, online communities transform blind box consumption into a collective social experience in which consumers mutually reinforce one another's emotional and social rewards.

In previous studies, online interactions have often been investigated as a motivational factor that directly influences consumers to purchase behaviour. For example, Yang's (2022) study identified online interaction as a motivator for online learners to actively learn, and Shen's (2020) study also identified online interaction as an important influence on purchase behaviour in online communities. It is argued in the present study that in the context of blind boxes, the interaction elements are not merely a platform for communication as stipulated in past studies. The interaction elements in blind boxes play a unique role as it provides the platform for the customers to share their play experiences. For example, they may share the acquisition of a time limited offer toy to the envy of others, hence not only enhancing their experience and encouraging them to purchase more but additionally also motivate others to pursue the offers in the future (Gupta, Chitkara, & Thakur, 2024). However, how these interactions specifically influence the relationship between the play experiences and purchases has yet to be fully explained. Therefore, in extension to past studies, the

present study seeks to examine how interaction within the online community moderates the relationships between the gamification elements factors including rewards system, scarcity, user engagement, visual design, brand story, user experience, and blind box purchase behaviour.

While gamification elements such as rewards and scarcity directly influence consumer behaviour, interaction within online communities serves as an important moderator in this relationship. Community-driven engagement enhances the effectiveness of gamification by providing social validation and fostering a sense of achievement among consumers (Hanaysha, Sharma, Shriedeh, & Majid, 2023). The online communities offer many avenues to foster sense of togetherness such as through storytelling, group challenges and polling events (Xu et al., 2020). The emotional and social appeal of blind box consumption is also strengthened when consumers gain recognition on their prized collections or the acquisition of rare items, thereby further strengthening the effects of gamification (Zhang, 2023), and encouraging them to buy more (Hu, Qin, & Sekar, 2024).

3. THEORETICAL DEVELOPMENT

This study employs the Gamification Theory as theoretical lens in explaining the direct effects of gamification mechanics in blind boxes on purchase behaviour of blind box online communities. Blind box in this study is viewed as a form of gameplay in which the gamification elements play a pivotal role to motivate, engage and activate behaviour (Seaborn & Fels, 2020; Simonofski, 2022). The gamification elements in blind box consumption model such as reward points, badges, scarce items, and progression of play are designed to stimulate emotional responses. Like gameplaying, consumers of blind boxes are attracted to the thrill of a surprise, the satisfaction of completing a collection, and the excitement of accomplishing a difficult feat such as acquiring a rare item.

To further explain the specific mechanisms of gameplay in blind box consumption, this study incorporates the Mechanics-Dynamics-Aesthetics (MDA) framework (Hunicke, LeBlanc, & Zubek, 2004) into the conceptual framework. The MDA framework

operationalises the gamification elements in three interconnected layers:

- **Mechanics:** These are the rule-based components directly designed to influence user behaviour—such as rewards systems, scarcity tactics, visual design, brand story, and platform features contributing to user experience.
- **Dynamics:** These refer to three categories of interactions namely interaction among users, interaction between users and the interaction between user and system. These interactions are captured through interaction variables such as frequency, satisfaction, and perceived social influence.
- **Aesthetics:** These denote emotional experiences resulting from interactions in the gameplay, including satisfaction, excitement, or a sense of accomplishment that ultimately drive purchase decisions.

The MDA provides a multi-level understanding of how blind box marketing operates within online communities by identifying which game design elements matter (mechanics), how users respond to them in real time (dynamics) and what affective outcomes they generate (aesthetics).

This study proposes that the game design elements (mechanics) influence blind box purchase behaviour through emotional and interactive engagement (aesthetics and dynamics). These elements are delineated as follows:

- **Rewards System (RS):** Incentives that are designed into the game (e.g., points, badges) that aim to reinforce behaviours and encourage repeat purchases.
- **Scarcity (SC):** The perception that items are rare and of limited availability thus making purchases highly urgent and exclusive.
- **User Engagement (UG):** The active involvement of users in online community activities such as unboxing or polling events
- **Visual Design (VD):** The aesthetics of blind box packaging and platform interfaces that shape first impressions and perception of usability.
- **Brand Story (BS):** Brand narrative strategies that emotionally connect consumers with the product and brand.
- **User Experience (UX):** The overall user satisfaction with platform navigation, responsiveness, and usability.

In this study, interaction within online communities is positioned as a moderating variable, influencing the strength of the relationships between the six gamification elements and blind box purchase behaviour. Interaction within online communities is operationalised through engagement frequency, perceived quality of interaction and the extent to which community interactions provide social and emotional support. The conceptual framework of this study is presented in Figure 1.

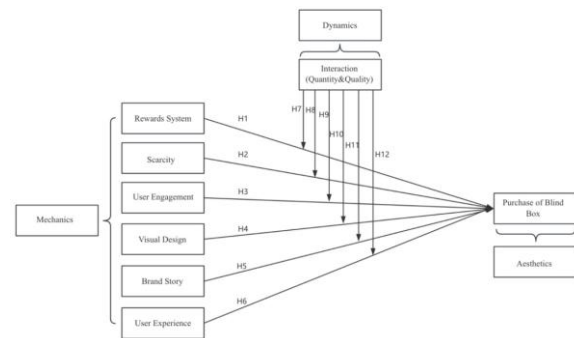


Figure 1- Research Conceptual Framework

In this study, it is posited that consumers are directly influenced by the gamification mechanics of the blind box consumption model, through the dimensions of rewards system, scarcity of blind box items and user engagement through paid (e.g. advertising), earned (e.g. user generated contents) or owned (brand website) marketing communication activities. These mechanics contribute to the overall aesthetic appeals of blind boxes and encourage consumers to purchase blind box. These direct effects, however, are stronger for consumers who are more interactive in online blind box communities compared to those who are not because the community platforms allow them to share information, compare or showcase their findings and gain social recognition from other users.

3.1 Hypotheses

The blind box is modeled on the reward systems found in gameplay. The reward system of blind boxes motivates and reinforces purchases through incentives such as points, badges, and exclusive items. Receiving these incentives gives consumers a sense of accomplishment and anticipation for the next reward (e.g. points, badges or items), thus acting as a reinforcement of interest to purchase and repurchase. Past studies have demonstrated that reward structures increase

user engagement, satisfaction, and repeated behaviours in digital environments (e.g. Xi and Hamari 2020; Xu et al., 2020). Additionally, these incentives also enable consumers to engage in social comparison and establish status within online communities, thus further reinforcing purchases. Therefore, in this study, blind box reward system is hypothesized to encourage purchase behaviour.

H1: The reward system of blind boxes has a significant positive effect on the purchase behaviour of blind boxes among consumers within online communities.

Scarcity in blind boxes refers to the consumers' perception that certain items are only available for a limited time or in limited quantity. Scarcity as a blind box gamification mechanic creates the perception of urgency and exclusivity, thus making the sought-after items more desirable. The marketing tactics used in blind box include limited time offers and exclusive releases of certain toy characters. These tactics are designed to create a fear of missing out (FOMO) and impulse purchases. Wu et al. (2021) and Aggarwal et al. (2011) found that scarcity significantly increases consumer excitement and positive actions in e-commerce and game-based contexts. Accordingly in this study, scarcity is expected to positively influence blind box purchase behaviour to obtain the limited items before the opportunity disappears.

H2: Scarcity has a significant positive effect on the purchase behaviour of blind boxes among consumers within online communities.

User engagement in blind box consumption refers to the emotional, cognitive, and behavioural involvement in brand-related interactions. During gameplay, higher levels of engagement enhance immersion, repeat playing and brand attachment. Prior research (e.g., Brodie et al., 2011; Cheung et al., 2021) has shown that higher engagement levels are positively associated with brand loyalty and purchase frequency. In blind box consumption, user engagement may include the sharing of unboxing experiences, commenting in forums, or trading items. These activities not only enhance consumers' enjoyment of playing but also as reinforcements of purchases. Therefore, it is hypothesised that user engagement within

online communities directly contributes to blind box purchase behaviour.

H3: User engagement has a significant positive effect on the purchase behaviour of blind boxes among consumers within online communities.

In the highly competitive blind box toy market, visual design plays a critical role in attracting consumers' attention and sustaining their interest. Brands design blind boxes with appealing and trendy packaging and distinctive toy characters, complemented by aesthetically pleasing online interface to enhance the perceived value of the blind box and consequently drive purchase intent. Studies such as those by Cyr et al. (2010) and Wang et al. (2012) confirm that intuitive and attractive design fosters trust, satisfaction, and higher conversion rates. Consequently, strong visual design is hypothesised to positively impact blind box purchase behaviour.

H4: Visual design has a significant positive effect on the purchase behaviour of blind boxes among consumers within online communities.

Blind box toy retailers enhance the desirability of the toys by attaching appealing brand stories, usually about the characters in the series. The brand stories build interests and emotional resonance to make purchases more meaningful. Compelling brand stories contributes to purchase behaviour by creating immersion in the character and world of the blind box series. Escalas (2004) and Lundqvist et al. (2013) research supports the notion that narratives strengthen brand authenticity, consumer connection, and behavioural loyalty. In blind box communities, a cohesive brand story enhances the collective emotional experience and reinforces repeat purchasing. Hence, this study hypothesises that brand storytelling positively influences blind box purchase behaviour by fostering emotional engagement and meaningful consumption experience.

H5: Brand stories have a significant positive effect on the purchase behaviour of blind boxes among consumers within online communities.

In blind box consumption, user experience refers to consumers' experiences on the blind box online platforms including the platforms' navigation, responsiveness, usability and the

satisfaction that users derive from using them. A consumer who experiences a seamless and enjoyable consumption journey are more likely to continuously engage with the brand and repurchase. Harris and Goode (2010) and Rose et al. (2012) demonstrated that a positive user experience significantly predicts purchase intention and platform loyalty. Therefore, user experience is hypothesised to positively influence blind box purchase behaviour.

H6: User experience has a significant positive effect on the purchase behaviour of blind boxes among consumers within online communities.

Consumer interaction within blind box online communities helps them fulfil their social needs and contribute towards their emotional gratifications. Frequent and positive interactions can amplify the effects of rewards (H7), scarcity (H8), engagement (H9), visual design (H10), brand story (H11), and user experience (H12) by fostering shared experiences, social validation, and peer support. Past studies including those by Hollebeek et al. (2014), Brodie et al. (2011) and Dessart et al. (2015) have shown that interaction moderates the influence of gamification by increasing emotional engagement, social bonding, and cognitive absorption. Therefore, in this study interaction is hypothesized to act as a moderator that intensifies the relationship between gamification mechanics and blind box purchase behaviour, making it a critical variable in understanding consumer responses in gamified digital communities.

H7-H12: Interaction positively moderates the relationship between gamification elements and blind box purchase behaviour among consumers within online communities.

4. METHODOLOGY

4.1 Participants and Sampling

This study focuses on the blind box toy consumption among consumers within online blind box communities in China. Therefore, the target population for this study comprised of Chinese who regularly purchase blind box and actively participate in blind box online communities. Using a purposive sampling method, data was collected through an online questionnaire distributed via Google Forms. Filter questions were used to ensure that participants were regular purchasers of blind box toys and active participants in online blind

box communities. The survey disseminated to the participants through WeChat, Weibo, and other community-specific platforms. The data collection resulted in 436 usable responses.

4.2 Measurements

Participants completed the first section of the questionnaire that focuses on demographics data, followed by another section on the variables of the study consisting of the six gamification constructs and the moderator. Participants evaluated the construct using a five-point Likert scale ranging from 1 ("strongly disagree") to 5 ("strongly agree").

The measurements for the constructs were adapted from prior studies. The first construct, reward system, was derived from Lee et al. (2025). The four items for the construct reflect measurements on the effectiveness of rewards in influencing purchase behaviour. The second construct, scarcity (SC), was adapted from Baptista et al. (2021). Four items were used to measure dimensions of limited availability related to purchase decisions. User engagement (UG) was assessed using four items adapted from Li and Zhu (2021), reflecting dimensions of online community members' interaction and involvement. Visual design (VD) was measured using four items adapted from Noguti and Waller (2020), focusing on product packaging and aesthetic appeal. Brand storytelling (BS) was evaluated using four items adapted from Clark (2024) which examined the role of narrative in enhancing emotional connection and consumer trust. User experience (UX) was measured using four items adapted from Avramova (2021), reflecting consumers' perceptions of usability, satisfaction, and convenience during blind box purchase process. Online community interaction (IN) was measured using four items adapted from a study by Avramova (2021), focusing on the frequency and quality of consumer communication within blind box communities. Finally, purchase of blind box (PBB) was assessed using four items from Mvondo, Jing, and Hussain (2023), reflecting the consumer's purchasing frequency, spending amount, and motivations related to blind box products.

5. RESULTS

5.1 Data Analysis Procedure

To assess the relationships in the structural model, this study employed partial least

squares structural equation modelling (PLS-SEM) as it is well-suited for exploring complex relationships among latent variables, especially in models involving multiple constructs and moderating effects. This approach is advantageous for handling relatively small sample sizes and predicting variance-based outcomes (Hair et al., 2019). The study used Smart PLS 4.0 software using the two-step approach, first validating the measurement tools followed by the testing of the hypothesized relationships (Hair et. al 2019).

5.2 Measurement Model Assessment

This study first assessed the measurement model to examine the validity and reliability of the constructs. In the measurement model, we assessed the factor loadings, the Cronbach α (CA), composite reliability (CR) and average variance extracted (AVE) (see Table 1). All factor loadings in the PLS-SEM model exceeded 0.70, indicating strong indicator reliability and

surpassing the recommended threshold (Hair et al., 2021). This result demonstrates satisfactory internal consistency across all constructs. Additionally, Cronbach's alpha and composite reliability values for each construct were above 0.70, meeting the recommended threshold for reliability (Hair et al., 2020).

The AVE values were all above 0.5. To assess the discriminant validity, the study employed the Heteroit-Monotrait ration of correlation criterion. The results in Table 2 indicate that all values were below the threshold of 0.85 (Henseler et al., 2016). Moreover, the factor loadings of each item within its respective dimensions are greater than the loadings on other dimensions, indicating that the data exhibits good discriminant validity. Furthermore, to address potential common method bias, Harman's one-factor test was conducted, considering the cross-sectional nature of the study (Kock, 2015). The results

Table 1: Reliability Analysis of Constructs

	Item	Loadings	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
BS	BS1	0.866	0.888	0.889	0.922	0.748
	BS2	0.857				
	BS3	0.862				
	BS4	0.875				
IN	IN1	0.882	0.935	0.936	0.95	0.793
	IN2	0.909				
	IN3	0.896				
	IN4	0.887				
	IN5	0.878				
PBB	PBB1	0.837	0.872	0.873	0.913	0.723
	PBB2	0.853				
	PBB3	0.852				
	PBB4	0.861				
RS	RS1	0.838	0.871	0.874	0.912	0.721
	RS2	0.855				
	RS3	0.859				
	RS4	0.846				
SC	SC1	0.853	0.868	0.869	0.91	0.717
	SC2	0.864				
	SC3	0.839				
	SC4	0.83				
UG	UG1	0.845	0.87	0.874	0.911	0.719
	UG2	0.862				
	UG3	0.835				
	UG4	0.894				
UX	UX1	0.894	0.862	0.869	0.916	0.783
	UX2	0.874				
	UX3	0.888				
VD	VD1	0.851	0.888	0.891	0.922	0.748
	VD2	0.854				
	VD3	0.881				
	VD4	0.872				

Table 2: Discriminant Validity (HTMT)

	BS	IN	PBB	RS	SC	UG	UX	VD
BS								
IN	0.077							
PBB	0.542	0.473						
RS	0.511	0.085	0.543					
SC	0.449	0.074	0.51	0.519				
UG	0.456	0.123	0.528	0.541	0.471			
UX	0.522	0.08	0.556	0.478	0.504	0.521		
VD	0.566	0.047	0.576	0.524	0.554	0.575	0.585	
IN x BS	0.049	0.199	0.352	0.085	0.027	0.032	0.131	0.121
IN x RS	0.092	0.142	0.24	0.058	0.07	0.026	0.092	0.073
INx UX	0.132	0.239	0.37	0.087	0.035	0.032	0.013	0.053
IN x S	0.033	0.212	0.234	0.069	0.089	0.033	0.036	0.08
IN x VD	0.128	0.184	0.345	0.071	0.082	0.045	0.042	0.137
IN x UG	0.031	0.166	0.31	0.022	0.045	0.022	0.033	0.048

indicated that common method variance was below 50%, confirming that common method bias did not pose a significant threat to the study's validity.

5.3 Structural Model Assessment

Collinearity refers to the distortion or inaccuracy in model estimation caused by exact or high correlations between explanatory variables in a model. Generally, the larger the VIF value, the more pronounced the collinearity issue. A VIF value below 5 is commonly used as a threshold. As shown in the table, all VIF values are below 5, indicating that there are no serious collinearity problems in the data (Table 3).

5.4 Assessment of path coefficients

The bootstrapping procedure was conducted with 5,000 sub-samples, using the one-tailed

test 0.05 significance level (Figure 2). Table 3 presents the statistics on the structural model.



Figure 2: Structural model assessment

Table 3: Structure model assessment

	PBB (VIF)	Beta	SD	t value	p value	R ²	Q ²	F ²
BS	1.612	0.126	0.038	3.361	0.001	0.639	0.613	0.027
RS	1.589	0.128	0.036	3.564	0.000			0.029
SC	1.557	0.134	0.038	3.555	0.000			0.032
UG	1.598	0.111	0.035	3.159	0.002			0.021
UX	1.66	0.152	0.038	4.408	0.000			0.039
VD	1.857	0.143	0.040	3.612	0.000			0.031
IN x BS	1.379	0.103	0.033	3.105	0.002			0.023
IN x RS	1.343	-0.011	0.035	0.330	0.741			0.000
IN x UX	1.47	0.141	0.034	4.154	0.000			0.038
IN x SC	1.412	-0.009	0.035	0.255	0.799			0.000
INx VD	1.498	0.079	0.034	2.286	0.022			0.011
IN x UG	1.438	0.113	0.034	3.380	0.001			0.022

The hypothesis testing results indicate that all direct relationships between gamification elements and the purchase behaviour of blind boxes in online communities were supported.

Specifically, the Rewards System (H1) ($\beta=0.128$, $t=3.564$, $p=0.000$), Scarcity (H2) ($\beta=0.134$, $t=3.555$, $p=0.000$), User Engagement (H3) ($\beta=0.111$, $t=3.159$, $p=0.002$), Visual Design (H4) ($\beta=0.143$, $t=3.612$, $p=0.000$), Brand Story (H5) ($\beta=0.126$, $t=3.361$, $p=0.001$), and User Experience (H6) ($\beta=0.152$, $t=4.408$, $p=0.000$) exhibit significant positive effects on blind box purchases, confirming that these gamification elements play a crucial role in influencing consumer buying behaviour.

Regarding the moderating effects, the results reveal that online interaction significantly moderates the relationships between User Engagement (H9) ($\beta=0.113$, $t=3.380$, $p=0.001$), Visual Design (H10) ($\beta=0.079$, $t=2.286$, $p=0.022$), Brand Story (H11) ($\beta=0.103$, $t=3.105$, $p=0.002$), and User Experience (H12) ($\beta=0.141$, $t=4.154$, $p=0.000$) with purchase of blind boxes.

The findings indicate that higher levels of community interaction strengthen the relationships between the four gamification factors and purchase behaviour. The study shows that active participation in online blind-box communities amplifies the influence of user engagement, visual design and brand story on consumers' purchase behaviour.

However, the effects of Rewards System (H7) ($\beta=-0.011$, $t=0.330$, $p=0.741$) and Scarcity (H8) ($\beta=-0.009$, $t=0.255$, $p=0.799$) were not significantly moderated by online interaction, indicating that these elements independently drive purchasing behaviour without requiring any reinforcement from community interaction.

The analysis of the R-squared (R^2) shows that the value exceeds 0.2, indicating that the explanatory variables account for a satisfactory proportion of the variance in blind box purchase behaviour. Additionally, the predictive relevance (Q^2) of the exogenous variables on the endogenous variables indicates a value greater than 0, thus confirming the predictive relevance of the model. The effect size of each relationship (f^2) is also shown in Table 4.

Table 4: PLS predict assessment of dependent variable

	Q^2	R^2	SRMR	f^2
PBB	0.613	0.639	0.036	
BS				0.027
RS				0.029
SC				0.032
UG				0.021
UX				0.039
VD				0.031
INxBS				0.023
INxRS				0.000
INxUX				0.038
INxSC				0.000
INxVD				0.011
INxUG				0.022

In summary, the findings indicate that although gamification elements directly contribute to purchase behaviour, online community interaction plays a key role in strengthening the effects of user engagement, brand story, visual design and user experience.

6. DISCUSSION

This study contributes to the understanding of the role of online community interaction in shaping the effects of gamification mechanisms on blind box purchase behaviour. Extending past research in examining blind box consumption, we adopt the MDA (Mechanics-Dynamics-Aesthetics) framework to explicate the gamification dimensions in blind box consumption and incorporate community online interaction as a moderator to reflect the blind box contemporary consumption environment. While earlier studies have primarily examined the direct effects of individual gamification elements, as Xu et al., (2020) and others have done, our work moves the field forward by showing how the dynamics of an online communities can shape and, in specific cases, amplify the impact that gamification has on the decision to buy blind boxes.

Specifically, the study shows that all six gamification elements examined, namely rewards system, scarcity, user engagement, visual design, brand story, and user experience, significantly influence consumer blind box purchase behaviour. These findings support our key proposition that the purchase of blind box resembles gameplay, with consumers purchasing decision driven by gamification elements embedded in both the blind box

marketing model (e.g, reward systems, item scarcity, visual design and brand story) as well as the online blind box platform (e.g, user engagement, user experience). Our findings further suggest that gamification mechanisms effectively shape consumer decision-making across various stages of the customer journey including problem recognition (e.g, the need for limited edition item), information search (e.g, finding the best deal) and showcasing (e.g, putting online limited item acquisition). The results in H1 and H2 confirm that both the reward system and scarcity serve as strong motivators, supporting past studies that show tangible rewards encourage continued engagement (Ma, Mao, & Hu, 2022), while limited product availability creates a sense of urgency, prompting immediate purchase decisions (Montoya & Flores, 2019).

Support for H3 to H6 further highlights the important role of experiential elements in blind box gamification. In tandem with previous gamification research demonstrating that user engagement increased intention to purchase (Moore et al., 2024; Ebrahimi et al., 2023), our study shows that both consumers' engagement with other users and platform contribute to stronger purchase behaviour. The findings also show that blind box consumers used visual design and brand storytelling as the differentiating factors in deciding on their blind box purchases, reflecting past studies that attribute the effects of these elements to emotional resonance and brand attachment (Andhini & Andanawarih, 2022; Chen, 2021). The results H6 further confirm the significance of the experiential elements blind box consumption, indicating that seamless and satisfying interaction with the platform is crucial to increase the likelihood of purchase (Watulingas & Permana, 2020).

Our study puts into perspective the way gamification components work in concert. The integration of reward systems with positive user experience can improve consumer satisfaction and enhance loyalty. Blind box brands that provide customers with various ways to collect points to exchange for exclusive merchandise can encourage repeat purchases as customers strive to achieve their goals (Wei, 2023). Similarly, the interplay between scarcity and visual design in the context of limited-edition packaging enhances the appeal of rare products (Qi et al., 2023).

Our findings can further be explained through psychological mechanisms, including loss aversion, the sunk cost effect, and fear of missing out (FOMO). Consumers of blind boxes chase for exclusive items in fear of not having what others have, drive them to make quicker decisions, and at the same time those who have previously invested in blind box series have to act quickly or otherwise would not be able to complete their collections.

Central to our study is the role of online community interaction in moderating the effects of certain gamification elements. The moderating role of online community engagement was significant for user engagement (H9), visual design (H10), brand story (H11), and user experience (H12). These findings support the notion that online communities enhance emotional connections and social influence, making gamification more impactful (Hollebeek, 2021; Gupta & Coskun, 2021; Wei, 2023; Qi, Deng, & Yang, 2023). Shared experiences and dialogue through community interaction strengthens consumers' affective and cognitive ties with the brand (Shamsi & Abad, 2023).

In contrast, the influence of system rewards (H7) and scarcity (H8) on purchase behaviour was not affected by online interaction. The findings suggest that system rewards and scarcity are not driven by external stimulants but rather by intrinsic psychological mechanisms such as instant gratification and urgency (Zhou & Liu, 2022; Chen et al., 2022). When consumers keep receiving rewards, they are more motivated to continue purchasing from the brand (Akram & Kortam, 2020). Scarcity works by enhancing the perceived value of the brand blind box, thus triggering the needs to obtain the blind box for oneself, and doing it urgently before others (Jain & Yadav, 2019; Ladeira, 2023; Kim, Yoo, & Park, 2025).

The results of this study contributes towards the understanding of China's expanding blind box market. The blind box industry in China exceeded RMB 29.5 billion in 2023, with a year on year growth surpassing 40%. This study indicates that the blind box consumption in China owe some of this success to the blind box online community. The blind box consumers in China has a high level of sophistication in their consumption where the value of blind box are co-created by the users with other users through their interaction in online

communities. These values range from functional (e.g, getting coveted items), social (e.g, trading and sharing with others) all the way to symbolic (e.g, identifying as top collector). Thus, blind box brand should actively pursue strategies to foster interactive blind box communities, whether through official brand communities or ones formed by fans. These active blind box market will not only ensure that the blind box market continue to thrive in China but also gain inroads in other countries.

7. CONCLUSION

This study contributes to the growing literature on blind box consumption. The integration of the MDA framework with Gamification Theory helps to explicate the mechanisms under which gamification influence blind box consumption. While the findings of the present study support prior research that shows the importance of the gamification elements in encouraging purchase (Che et al.; Alzaradi et al., 2023; Al-Zyoud, 2021), this study also indicates that online community interaction can amplify the effects of user experience, visual design, brand story and user engagement. Therefore, blind box consumption should be explained in tandem with the social gratifications that consumers gain from their purchases. The study demonstrates that the gamification strategies in contemporary blind box marketing should embrace the shift in digital consumer engagement, where enjoyment, socialisation, and commerce increasingly intersect.

This research is an extension of past research within the field of consumer psychology by examining the relationship between gamification and social influences on consumer behaviour. While earlier studies have acknowledged the importance of social engagement (Tobon, Ruiz-Alba, & García-Madariaga, 2020), this study explicitly demonstrates how community interaction enhances the effectiveness of specific gamification elements, offering a richer understanding of consumer decision-making in digital environments.

In practical terms, the findings advocate the use of a two-pronged strategy for marketers. The transactional aspects, including scarcity and incentives, are ideal for marketing campaigns designed to create instant buying actions (Gupta & Coskun, 2021). In contrast,

community-based experiential elements work best in promoting consumer engagement and loyalty. Aspects such as storytelling platforms, online communities, and challenges creation promote deeper consumer engagement and help create a sense of belongingness (Zhang, 2023; Zhang, Zhou, & Qin, 2022).

Within the rapidly changing environment of China's blind box industry, this study brings important lessons for domestic brand on how to leverage gamification for improving the effectiveness of their business model. The scarcity and rewards system such as limited-edition releases and flash sales can easily be integrated with storytelling and campaigns that reflect China's consumption culture. As the list of blind boxes is becoming increasingly diverse in terms of the categories ranging from toys to cosmetics and even digital collectibles, brands can further enhance purchase engagement by aligning gamification themes with trending cultural topics and local narratives.

8. LIMITATIONS AND FUTURE RESEARCH

The parameter of this study was set to include six gamification elements, and one moderating element to explain blind box purchase behaviour. Despite the valuable insights, greater depth of understanding could be gained by including other potentially influential variables such as cultural influences, economic factors and personality characteristics. Thus it is recommended that future research includes other external factors to further explicate the nuances in blind box purchase behaviour. The study could also be improved by moving beyond purposive sampling to employ probability-based sampling techniques and demographic segmentation to ensure broader representativeness and robustness of the findings. Additionally, the cross-sectional design employed in this study does not lend towards causal inferences. Future studies should consider longitudinal or experimental research designs to produce causal explanation on the effects of gamification and community interaction.

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ETHICS STATEMENTS

All participants of this study have provided informed consent in being part of this study. Data were fully anonymized to ensure the privacy and confidentiality of individuals.

REFERENCES

- Aggarwal, P., Jun, S. Y., & Huh, J. H. (2011). Scarcity messages. *Journal of Advertising*, 40(3), 19-30. <https://doi.org/10.2753/JOA0091-3367400302>
- Avramova, Y. R., Dens, N., & De Pelsmacker, P. (2021). Brand placement across media: The interaction of placement modality and frequency in film versus text. *Journal of Business Research*, 128, 20-30. <https://doi.org/10.1016/j.jbusres.2021.01.025>
- Baptista, N., Pinho, J. C., & Alves, H. (2021). Examining social capital and online social support links: A study in online health communities facing treatment uncertainty. *International Review on Public and Nonprofit Marketing*, 18(1), 57-94. <https://doi.org/10.1007/s12208-020-00263-2>
- Brodie, R. J., Hollebeek, L. D., Jurić, B., & Ilić, A. (2011). Customer engagement: Conceptual domain, fundamental propositions, and implications for research. *Journal of service research*, 14(3), 252-271. <https://doi.org/10.1177/1094670511411703>
- Cao, H. (2024). Generation Z's surprise narrative and value monetization: The operation logic and risk of blind box marketing. *Highlights in Business, Economics and Management*, 27, 189-198. <https://doi.org/10.54097/sbh50255>
- Che, T., Peng, Y., Zhou, Q., Dickey, A., & Lai, F. (2023). The impacts of gamification designs on consumer purchase: A use and gratification theory perspective. *Electronic Commerce Research and Applications*, 59, 101268. <https://doi.org/10.1016/j.elerap.2023.101268>
- Cheung, M. L., Pires, G. D., Rosenberger, P. J., Leung, W. K., & Sharipudin, M. N. S. (2021). The role of consumer-consumer interaction and consumer-brand interaction in driving consumer-brand engagement and behavioural intentions. *Journal of Retailing and Consumer Services*, 61, 102574. <https://doi.org/10.1016/j.jretconser.2021.102574>
- Clark, J. R., Large, D. R., Shaw, E., Nichele, E., Trigo, M. J. G., Fischer, J. E., Burnett, G., & Stanton, N. A. (2024). Identifying interaction types and functionality for automated vehicle virtual assistants: An exploratory study using speech acts cluster analysis. *Applied Ergonomics*, 114, 104152. <https://doi.org/10.1016/j.apergo.2023.104152>
- Cyr, D., Head, M., & Larios, H. (2010). Colour appeal in website design within and across cultures: A multi-method evaluation. *International journal of human-computer studies*, 68(1-2), 1-21. [10.1016/j.ijhcs.2009.08.005](https://doi.org/10.1016/j.ijhcs.2009.08.005)
- Dessart, L., Veloutsou, C., & Morgan-Thomas, A. (2015). Consumer engagement in online brand communities: A social media perspective. *Journal of Product & Brand Management*, 24(1), 28-42. <https://doi.org/10.1108/JPBM-06-2014-0635>^{11 SEP}
- Deterding, S., Dixon, D., Khaled, R., & Nacke, L. (2011). From game design elements to gamefulness: Defining "gamification." *Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments*, 9-15. Association for Computing Machinery. <https://doi.org/10.1145/2181037.2181040>
- Ebrahimi, P., Khajeheian, D., Soleimani, M., Gholampour, A., & Fekete-Farkas, M. (2023). User engagement in social network platforms: What key strategic factors determine online consumer purchase behaviour? *Economic Research-Ekonomska Istraživanja*, 36(1), Article 2106264. <https://doi.org/10.1080/1331677X.2022.2106264>^{11 SEP}
- Escalas, J. E. (2004). Narrative processing: Building consumer connections to brands. *Journal of Consumer Psychology*, 14(1-2), 168-180. https://doi.org/10.1207/s15327663jcp1401&2_19^{11 SEP}

- Gupta, S., Chitkara, S., & Thakur, R. R. (2024). Online advertising and purchase intention: Thematic, sentiment and framework analysis using NVivo. *Journal of Content, Community & Communication*, 12(1). <https://doi.org/10.31620/JCCC.12.24/08>
- Hanaysha, J. R., Sharma, A., Shriedeh, F. B., & Majid, M. (2023). Investigating the impact of social media advertising features on brand equity and brand experience in the retail industry. *Journal of Content, Community & Communication*, 17, 190–202. <https://doi.org/10.31620/JCCC.09.23/15>
- Harris, L. C., & Goode, M. M. H. (2010). Online servicescapes, trust, and purchase intentions. *Journal of Services Marketing*, 24(3), 230–243. <https://doi.org/10.1108/08876041011040631>
- Henseler, J., Hubona, G. and Ray, P.A. (2016), "Using PLS path modeling in new technology research: updated guidelines", *Industrial Management and Data Systems*, Vol. 116 No.1, pp. 2-20. 10.1108/IMDS-09-2015-0382
- Hollebeek, L. D., Glynn, M. S., & Brodie, R. J. (2014). Consumer brand engagement in social media: Conceptualization, scale development and validation. *Journal of Interactive Marketing*, 28(2), 149–165. <https://doi.org/10.1016/j.intmar.2013.12.002>
- Hu, M., Qin, T., & Sekar, S. (2024). Pricing and Rarity Design of Blind Boxes with Random Items. *SSRN Electronic Journal*. <https://doi.org/10.2139/ssrn.4929281>
- Huang, J. (2024). The impact of blind box economy on consumer behaviour in social media networks. *Highlights in Business, Economics and Management*, 41, 613–619. <https://doi.org/10.54097/2ahaej61>
- Hunicke, R., LeBlanc, M., & Zubek, R. (2004). *MDA: A formal approach to game design and game research*. In *Proceedings of the AAAI Workshop on Challenges in Game AI* (Vol. 4, No. 1).
- Jain, V., & Yadav, S. (2019). The effectiveness of guerrilla marketing: A review and conceptual framework. *International Journal of Marketing Studies*, 11(2), 42–56.
- Jin, S. V., & Ryu, E. (2020). "I'll buy what she's #wearing": The roles of envy toward and parasocial interaction with influencers in Instagram celebrity-based brand endorsement and social commerce. *Journal of Retailing and Consumer Services*, 55, Article 102121. <https://doi.org/10.1016/j.jretconser.2020.102121>
- Khatrri, B., Saxena, C., Nandini, G., Khan, S. A., & Alaskar, K. (2024). Inside the gamer's mind: A comprehensive exploration of online game addiction on psychological wellbeing and the moderating effect of physical activity. *Journal of Content, Community & Communication*, 12(1). <https://doi.org/10.31620/JCCC.12.24/05>
- Kim, H., Yoo, J., & Park, M. (2025). Metaverse friends with social benefits: Effects of social identity on the intention to purchase virtual products through site attachment, user engagement, and public self-consciousness. *Journal of Retailing and Consumer Services*, 83, Article 104158. <https://doi.org/10.1016/j.jretconser.2024.104158>
- Kock, N. (2015), "Common method bias in PLS-SEM: a full collinearity assessment approach", *International Journal of e-Collaboration (e-Collaboration)*, Vol. 11 No. 4, pp. 1-10.
- Ladeira, W. J., Lim, W. M., Santini, F. de O., Rasul, T., Perin, M. G., & Altinay, L. (2023). A meta-analysis on the effects of product scarcity. *Psychology & Marketing*, 40(7), 1267–1279. <https://doi.org/10.1002/mar.21816>
- Lee, C., Wyllie, J., & Brennan, S. (2025). Eye-opening! Exploring uncertainty marketing through hedonic blind box collectibles. *Journal of Retailing and Consumer Services*, 82, 104127. <https://doi.org/10.1016/j.jretconser.2024.104127>
- Li, H., & Zhu, F. (2021). Information transparency, multihoming, and platform competition: A natural experiment in the daily deals market. *Management Science*, 67(7), 4384–4407. <https://doi.org/10.1287/mnsc.2020.3718>
- Li, R., & Choi, A. Y. (2023). Research on blind box packaging design based on consumer psychology. *International Journal of*

- Advanced Culture Technology*, 11(3), 163–171.
<https://doi.org/10.17703/IJACT.2023.11.3.163>
- Liu, S.-W., Huang, W., Rao, H., & Fu, Y.-K. (2023). Ternary economic analysis of blind-box marketing. *Economic Research-Ekonomska Istraživanja*, 36(3), 1–22.
<https://doi.org/10.1080/1331677X.2023.2183517>
- Loi, K.-I., & Wong, J. W. C. (2023). Technology trends and trip planning. In A. M. Morrison & D. Buhalis (Eds.), *Routledge handbook of trends and issues in global tourism supply and demand* (pp. 189–198). Routledge.
<https://doi.org/10.4324/9781003260790-20>
- Lundqvist, A., Liljander, V., Gummerus, J., & van Riel, A. (2013). The impact of storytelling on the consumer brand experience: The case of a firm-originated story. *Journal of Brand Management*, 20(4), 283–297.
<https://doi.org/10.1057/bm.2012.15>
- Ma, Q., Mao, W., & Hu, L. (2022). Electrophysiological evidence for the effects of pain on the different stages of reward evaluation under a purchasing situation. *Frontiers in Psychology*, 13, Article 943699.
<https://doi.org/10.3389/fpsyg.2022.943699>
- Mason, N. L., Theunissen, E. L., Hutten, N. R., Tse, D. H., Toennes, S. W., Jansen, J. F., Stiers, P., & Ramaekers, J. G. (2021). Reduced responsiveness of the reward system is associated with tolerance to cannabis impairment in chronic users. *Addiction Biology*, 26(1), e12870.
<https://doi.org/10.1111/adb.12870>
- Montoya, R., & Flores, C. (2019). Buying free rewards: The impact of a points-plus-cash promotion on purchase and reward redemption. *Marketing Letters*, 30(1), 107–118. <https://doi.org/10.1007/s11002-019-09482-y>
- Mulcahy, R. F., McAndrew, R., Russell-Bennett, R., & Iacobucci, D. (2021). “Game on!” Pushing consumer buttons to change sustainable behaviour: A gamification field study. *European Journal of Marketing*, 55(10), 2593–2619.
<https://doi.org/10.1108/ejm-05-2020-0341>
- Mvondo, G. F. N., Jing, F., & Hussain, K. (2023). What’s in the box? Investigating the benefits and risks of the blind box selling strategy. *Journal of Retailing and Consumer Services*, 71, Article 103189.
<https://doi.org/10.1016/j.jretconser.2022.103189>
- Noguti, V., & Waller, D. S. (2020). Motivations to use social media: Effects on the perceived informativeness, entertainment, and intrusiveness of paid mobile advertising. *Journal of Marketing Management*, 36(15-16), 1527–1555.
<https://doi.org/10.1080/0267257X.2020.1799062>
- Onofrei, G., Filieri, R., & Kennedy, L. (2022). Social media interactions, purchase intention, and behavioural engagement: The mediating role of source and content factors. *Journal of Business Research*, 142, 100–112.
<https://doi.org/10.1016/j.jbusres.2021.12.031>
- Prentice, C., Han, X. Y., Hua, L. L., & Hu, L. (2019). The influence of identity-driven customer engagement on purchase intention. *Journal of Retailing and Consumer Services*, 47, 339–347.
<https://doi.org/10.1016/j.jretconser.2018.12.014>
- Qi, A., Sudtasan, T., Kewprasopsak, T., & Suriya, K. (2024). The impact of online community on blind box repurchase intention. In *RSEP International Multidisciplinary Conference* (pp. 27–35). Dubai, UAE.
<https://doi.org/10.64097/hbem.v24i.98776>
- Qi, B., Deng, T., & Yang, Z. (2023). The role of user experience in the impact of low-carbon building characteristics on consumer’s housing purchase intention. *Sustainability*, 15(13), Article 10194.
<https://doi.org/10.3390/su151310194>
- Rose, S., Clark, M., Samouel, P., & Hair, N. (2012). Online customer experience in e-retailing: An empirical model of antecedents and outcomes. *Journal of Retailing*, 88(2), 308–322.

- <https://doi.org/10.1016/j.jretai.2012.03.001>
- Seaborn, K., Pennefather, P., & Fels, D. I. (2020). Eudaimonia and hedonia in the design and evaluation of a cooperative game for psychosocial well-being. *Human-Computer Interaction*, 35(4), 289-337. <https://doi.org/10.1080/07370024.2018.1555481>
- Shamsi, M. S., & Abad, A. (2023). Creating purchase intention through social media: The use of AR enabled social media filters. *Journal of Content, Community & Communication*, 17(9), 46-62. <https://doi.org/10.31620/JCCC.06.23/05>
- Simonofski, A., Zuiderwijk-van Eijk, A. M. G., Clarinval, A., & Hammedi, W. (2022). Tailoring open government data portals for lay citizens: A gamification theory approach. *International Journal of Information Management*, 65, Article 102511. <https://doi.org/10.1016/j.ijinfomgt.2022.102511>
- Tobon, S., Ruiz-Alba, J. L., & García-Madariaga, J. (2020). Gamification and online consumer decisions: Is the game over? *Decision Support Systems*, 128, Article 113167. <https://doi.org/10.1016/j.dss.2019.113167>
- Wang, X., Yu, C., & Wei, Y. (2012). Social media peer communication and impacts on purchase intentions: A consumer socialization framework. *Journal of Interactive Marketing*, 26(4), 198-208. <https://doi.org/10.1016/j.intmar.2011.11.004>
- Watulingas, E. B., & Permana, D. (2020). The influence of user interface, user experience and digital marketing toward purchase intention (Study in Sejasa.com). *International Humanities and Applied Science Journal*, 3(2), 35-39. <https://doi.org/10.22441/ihaj.2020.v3i2.05>
- Wu, X. (2023). Analysis of China's blind box economy – Taking POP MART as an example. In *Proceedings of the 6th International Conference on Economic Management and Green Development* (pp. 189-196). Springer. https://doi.org/10.1007/978-981-19-7826-5_18
- Wu, Y., Xin, L., Li, D., Yu, J., & Guo, J. (2021). How does scarcity promotion lead to impulse purchase in the online market? A field experiment. *Information & Management*, 58(1), Article 103283. <https://doi.org/10.1016/j.im.2020.103283>
- Xu, Y., Chen, Z., Peng, M. Y. P., & Anser, M. K. (2020). Enhancing consumer online purchase intention through gamification in China: Perspective of cognitive evaluation theory. *Frontiers in Psychology*, 11, 581200. <https://doi.org/10.3389/fpsyg.2020.581200>
- Yang, C., Chen, X., Sun, J., Wei, W., Miao, W., & Gu, C. (2022). Could surplus food in blind box form increase consumers' purchase intention? *Agriculture*, 12(6), Article 864. <https://doi.org/10.3390/agriculture12060864>
- Zhang, Z. (2023). Customer perceived value of blind box to customer satisfaction and customer loyalty. *SHS Web of Conferences*, 165, 01002. <https://doi.org/10.1051/shsconf/202316501002>
