A Study on the Purchase Factors of Mobile Game Loot Box - Taking Tower of Saviors as an Example

Wei Han Hsu, National Yunlin University of Science and Technology, Taiwan
Wen Shan Chang, National Yunlin University of Science and Technology, Taiwan

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Abstract
With the rapid development of smart phones, nearly 70% of Taiwan's population currently owns smart phones, and nearly 90% of Google Play users have access to mobile Internet. With the integration of smart phones into people's lives, they also drives the demand for APP applications. The needs of the program. The game-related APP is currently the most profitable category in the software market. It also represents that leisure time of playing mobile games has become a part of many people's daily entertainment. In the current business mode of mobile games, many popular games attract players by means of free play, and loot box to stimulate the player's desire to purchase. The decisive factors affecting the desire to purchase will be game developers and important information for marketers. Therefore, this study will use the well-known mobile game "Tower of Saviors" as an example to explore the purchase factors of the loot box. This study is based on the EKB (Engel-Kollat-Blackwell) Model and conducts in-depth interviews with ten players. The results of the study shown that among the many factors affecting purchase, consumers will choose a lottery because of their quality and ability. The appearance of the character is also the main factor affecting the motivation of purchase. This study expects the results of the study to identify the purchase factors of the loot box for mobile games. Furthermore, provide a reference direction for game makers to design or formulate marketing strategies in the future.

Keywords: purchase factors, EKB Model, loot box

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1. Introduction

Smart phones had become part of the lives of Taiwanese over time. By the third quarter of 2018, the number of mobile communication subscribers in Taiwan had reached 29.943 million. An increase of 317,000 subscribers compared with the same period last year (National Communications Commission, 2018). In 2017, 92% of Google Play users in Taiwan use mobile phones to access the Internet, which is twice as many as 2013(Hung, 2018). According to the report of Digital Service Innovation Institute, 61% of people use mobile phones for more than three hours a day, compared with 2014 to have 16% growth (Institute for Information Industry, 2018).

With the popularity of smart phones, the App market has also become active. In 2012, the total number of downloads of the iOS store and the Google Play store was about 2 billion times. By 2017, the total number of downloads in the iOS store grew to 30.5 billion times, and the total number of downloads in the Google Play store hits 81 billion times with record high (Cheney, 2018; Kristianto, 2018). These figures show that the app market has become the focus of current attention.

In order to organize the app-related data, Institute for Information Industry divides the app into 16 categories including social chat, audio and video entertainment, application tools, map/navigation, news, mobile games, weather, video/photo editing, mobile shopping, financial management, office Business, travel, book and animation , educational learning, health and fitness and health care (Institute for Information Industry, 2017).

Among these categories, the game's total app downloads are less than 40%, but it covers more than three fourths of the total revenue of the market (Cheney, 2018; Kristianto, 2018), showing that the game-related categories are currently the most active items in the app market. As for the gaming app market in Taiwan, it ranks fifth in the world. In the first half of 2018, the total revenue of iOS stores and Google Play stores totaled are more than 700 million US dollars (App Annie, 2018). Taiwan has high potential market to attract gaming business to invest.

Wu (2018) believes that by having the insight of the trend of the market, it is possible to set right marketing strategies more efficiently and generate more revenues. Market Intelligence & Consulting Institute (2018) had mentioned about more than 50% of the paying players in Taiwan purchase virtual currency in the game and use it buy loot boxes, which corresponds to the idea that the loot boxes is the most profitable mechanism in the Free-to-play model (Yuan, Chen, Chang, & Dai, 2018). It is known that the loot box system is the current trend in the market. The student group is also a market that cannot be ignored. More than 60% of underage players are willing to spend money on the game. Wu believes that the game developers should focus on these truly contributing paying players (Institute for Information Industry, 2018).

To sum up the views from what had mentioned above, this study found that underage players will become the target group for the future of the game business, and the loot box System is the most profitable business model in recent years. Therefore, this research is based on the "Tower of Saviors", a mobile game that has been active in the

Taiwan game market for many years. The study is based on the EKB Model proposed by Engel, Kollat and Blackwell, in-depth interviews with players who have purchased virtual products in the Tower of Saviors when they are students. Exploring players' decision process buying loot boxes, sorting out the factors that loot boxes attract players to buy, and then understand the preferences of the student group. It is expected that the research results can provide as reference for the game developers to design or formulate the marketing strategy in the future.

After aligning the above points, this study found that underage players will become the target group for the future of the game developers, and the loot box System is the most profitable business model in recent years. Therefore, this research is based on the "Tower of Saviors", a mobile game that has been active in the Taiwan game market for many years. The study is based on the EKB Model proposed by Engel, Kollat and Blackwell, in-depth interviews with players who have purchased virtual products in the Tower of Saviors when they are students. Exploring players' decision process buying loot boxes, sorting out the factors that loot boxes attract players to buy, and then understand the preferences of the student group. It is expected that the research results can provide as reference for the game developers to design or formulate the marketing strategy in the future.

2. Literature Review

2.1 Free to Play

Compared to paid games, Free-to-play model games do not cost anything prior playing the game (Pereira, 2015). Game business owner will rely on in-game microtransactions to run games (Abarbanel, 2018). Microtransaction means that players can make micropayments to purchase virtual products in the game. Lin said that the combination of Free-to-play model and loot box system has already become the mainstream of mobile game business model (Chou, 2017).

The concept of loot box was from Japanese version of Maple Story in 2004 (Gyuman, 2016). It is a form of microtransaction, in which the players pay for virtual currency to obtain game items randomly. According to the way the game is presented, Taiwanese players refer to the loot box for the shape of the gashapon machine as "egg pool", the shape of the card is called "card pool", and English called "loot box" in general. Loot box system usually set up in the game store for players. Players can use cash to purchase virtual currency to buy loot boxes. After opening the loot box, players will get virtual items randomly (Department of Consumer Protection, 2018). These virtual items may be skins, equipment, weapons, spells, currencies, avatars, etc. The open of loot boxes is accompanied by sound and light effects, and if players draw rare prizes or even the highest rarity prizes, there will be a more special presentation. And the probabilities of each prize are opposite to their value or rarity.

2.2 EKB Model

The EKB Model is a widely used theory in the academic field. The existence of the EKB Model can be seen in many documents on consumer behavior (Chang, 2016; Shiau, 2016; Lo, Wang, & Fang, 2005; Shie, 2001; Liao, 2015; Jian, 2014), EKB Model can explain and predict consumer behavior more completely, systematically

and systematically (Wang, Pan, & Tsai, 2017; Chou, Su, & Lin, 2006).

Engel, Kollat, and Blackwell (1982) divide consumer behavior into five components: Input, Information Processing, Decision Process, Decision Process Variables, and External Influences. The decision process is a core part of the EKB Model and consists of five phases: Problem recognition, Search, Alternative evaluation, Choice, and Outcomes (Engel & Blackwell, 1982).

"Problem recognition" is derived from the emergence of "demand", which may come from the internal stimuli of the consumer or the external stimuli of the environment. Examples of the internal stimuli such as desire or physical and psychological deprivation; and examples of external stimuli such as broken mobile phones lead to the intention of purchasing new mobile phones.

"Search " means refers to information that consumers can find to solve problems after they have confirmed their needs. Usually consumers prioritize internal searches, and if the internal search can meet the information needs, one will stop searching. If consumers can't solve problems by internal searches, they will use external searches to get more information so that consumers can make decisions. Internal searches refers to consumers searching for information and experience in their own memory; external searches can be divided into personal sources, commercial sources and public sources such as family members, advertisements, consumer appraisal organizations, etc.

"Alternative evaluation" means consumers will select some acceptable plans from the evoked set and evaluate each plan with its own evaluation criteria by receiving enough information and find out the best choice in consumer's mind eventually. Evaluation criteria can be used to help consumers judge the pros and cons of different plans, such as the price, appearance, safety of the car. The determinant attributes are considered to be factors that have a great influence on the purchase decision, such as the safety of the car.

"Choice" means after evaluating the pros and cons and move to purchase behavior. The purchase behavior will be interfered by factors such as Important people's attitudes, purchase decisions, unplanned purchases, unpredictable situation. The final decision is not necessarily the same as the idea at the time. Important people's attitudes such as family and friends; purchase decisions such as what to buy, how many to buy, where to buy, when to buy, how to pay; unplanned purchases such as reminder purchase, impulse buying; unpredictable situation such as income fluctuations.

"Outcomes "mean consumer will evaluate whether the product meets expectations after purchased and use it. If performance is in line with expectations, there may be no particular feelings; if performance exceeds expectations, it will lead to satisfactory results. These two evaluations will enable consumers to adopt certain behaviors that are beneficial to the industry, such as positive word-of-mouth communication and continuous patronage. Conversely, if performance is lower than expected, consumers will continue to look for other suitable solutions.

3. Research methods

This study explores the purchasing factors of players purchasing loot boxes and interviews players about their decision process in order to identify factors that influence the decision processes. Since the decision process is affected by the interaction of internal and external factors, hence experimenting with quantitative methods may not completely receive the players' ideas (Lo, Wang, & Fang, 2005). For the above reasons, this study chose to conduct experiments with semi-structured interviews, because the purpose of this interview method is to explore the true thoughts of the respondents, and have reasonable objectivity, the respondents also can fully express opinions (Wan, 2004). Suitable for the subject of this study, expected to get a more complete thinking of players in the decision process.

In order to avoid distractions by temperature or noise, the researchers and respondents are in a quiet air-conditioned room for interviews. It takes half an hour to an hour for each interview. If the interviewee is willing to spend much time to explore more, the researcher will extend the interview time, but the total number of interview times will not change. The experiment was conducted with a self-made interview outline, using a mobile phone and a computer to record the experiment and converting it into a verbatim draft within 24 hours. During the interview, the researcher will ask the same question in a different way to confirm the completeness and consistency of the information.

The research based upon one-to-one approach to have in-depth interviews to find respondents by snowballing, and all respondents purchased virtual products from Tower of Saviors when they are students. A total of 10 respondents in this experiment, based on the principle of undisclosed respondents, players will be represented by the English letters A to J.

Based on the EKB Model, the content of the interview outline is based on five aspects of Problem recognition, Search, Alternative evaluation, Choice, and Outcomes in the decision process.

4. Research Results

4.1 Problem Recognition

The previous research mentioned about "demand" is caused by internal and external stimuli. This study analyzed the content of the interview and classified factors that stimulate players to open loot boxes into official, friends, network, game progress, level clear, enjoy the process, character appearance and character collecting.

Table 1
Stimulus that affects the desire to open loot boxes

Stimulus	Stimulus Introduction	Identify Members
official	Officials will launch new loot boxes at regular intervals. The items in the loot box may be previously launched characters, or they may be new characters. Before the loot box is set in the game, the official announcement will be issued a week ago. The content of the announcement will be repeated in the game, in the discussion group or on the website related to Tower of Saviors, thus arousing the interest of the players.	all players
friends	Since the players have played Tower of Saviors when they are students, players have regarded Tower of Saviors as a part of the pastime after class, and discussed the game with friends who also played Tower of Saviors. To meet the needs of interpersonal relationships.	all players
network	Players have the habit of using the Internet to search game-related information. The information they search is based on level clear and character ability. While the players absorb the information, the desire to buy loot boxes will be indirectly improved.	all players
game progress	The player who is beginner will have a strong intention to buy loot boxes as long as the number of virtual currency can buy loot box.	B, C
level clear	The ability and status of the character are a major factor affecting level clearance. In order to challenge more difficult levels, multiple characters must be teamed up, and prompts players to open loot boxes.	A, B, C, E, F, G, H
enjoy the process	Players enjoy the process of opening loot boxes. During the process, players will feel exciting because of the unknown result. This kind of surprise can relieve the pressure of life.	D, I, J
character appearance	The appearance of the character is the information that the player can get at first sight. Sometimes when people fall in love with a character at first sight, they will naturally open the loot box to get the character.	all players
character collecting	Players buy loot boxes for the purpose of collecting all characters.	E, J

The finding of the research is even if the stimuli are not directly related to loot boxes; it will affect the player's intention to buy loot boxes. For example, players will be motivated by the lineup of friends or guide websites, and buy loot boxes to reinforce their team.

Each player has different thinking for buying loot boxes at every stages of the game. For example, the beginner will have a strong intention to buy loot boxes because of the insufficient of characters, and experienced players buy loot boxes according to the timing. In order to move to difficult levels, most players need to buy loot boxes to get more powerful characters, but some players think that their team is strong enough,

getting powerful character is not the purpose to them, and experience the surprise of collecting unknown items is the main reason why they currently open loot boxes. Regardless of the purpose, all players want to be able to get a character that appearance they like. In addition, there are some players who want to collect all characters.

Overall, as long as the player has enough enthusiasm to continue the game, then anything can be a stimulus that motivates players to buy loot boxes.

4.2 Search

If the above had successful inspires the interests of the players, they will take action to find information related to those stimuli. According to the results of the interview, the contents of the players' query for loot boxes are loot box contents, character introduction, date of event start, date of double probability, event period and guarantee. The way for players get information is the official fan group, youtuber, friends and guide websites.

Table 2
The order of players getting information about loot boxes

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Information	Information Introduction
loot box contents	What kind of characters in this loot box?
character introduction	The abilities and status of the characters.
date of event start	The exact date and time when the event started.
date of double probability	The date of doubling the character probability during the event.
event period	How long does the event last and when it will end.
guarantee	Be sure to get a character after using a certain number of loot boxes.

In this study, the first thing to notice is loot box contents. If there is a player's favorite character in the loot box, which will have interests to do searches onwards. The most important information for players is loot box contents, character ability, and the date of double probability.

All players' information collection methods are roughly the same, the official fan group and friends are the main option, and the rest are the guide websites that players are used to.

In response to the announcement that the game automatically popped up when the game was opened, the researcher and players conducted a more in-depth discussion about it, and found that most players felt that they had reached the reminder when they first saw the pop-up announcement (A, B, C, E, F, G, I, J), but only some players are willing to read the details (A, B, C, J) in the game, and the rest of the players

search for relevant information outside the game. In addition, some players don't want to see announcements when they log in to the game as daily basis, which makes them feel bored (D, H, I).

To sum up, announcements that pop up too frequently in the game will cause some players feel to be troubled by the game for a long time. Players mainly tend to find the information they need by themselves, and their access to information is based on friends and the Internet.

4.3 Alternative Evaluation

The research analyzes the criteria of loot boxes choose and the criteria of virtual products purchase. This study found that the determinant attributes of players choosing loot box are character's appearance, powerful characters, lineup, and repetitive characters. The determinant attributes of purchasing virtual products are price, bonus, and high price performance ratio.

Table 3
The determinant attributes of players choosing loot box

determinant attributes	determinant attribute introduction	Identify Members
character's appearance	Sometimes when people fall in love with a character at first sight. If there is a favorite character in the loot box, players will choose to open the loot box.	E, I
powerful characters	The ability and status of the character are a major factor affecting level clearance. If there is a character in the loot box that can serve as the core of the team, players will choose to open the loot box.	B, C, H
lineup	In order to challenge more difficult levels, multiple characters must be teamed up. If there is a character in the loot box that matches players' current lineup, players will choose to open the loot box.	A, F
New characters	For the players, the characters already drawn by the team will not bring them a sense of freshness. If there is a character in the loot box that players does not have, players will choose to open the loot box.	D, G, J

The study found that players will be attracted by the character's powerful ability and appearance, and then choose the loot box containing the character, or find a character that can reinforce their team in the loot box. Everyone has their own ideas, but the common point is that the loot box cannot contain too many characters that have been launched before. Repeating the same characters will cause dissatisfaction to the players.

Table 4
The determinant attributes of purchasing virtual products

determinant attributes	determinant attribute introduction	Identify Members
price	Amount of virtual products sold.	B, C, D, G, H
bonus	Extra items obtained after purchasing virtual products in the game.	A, F, I
high price performance ratio	The same amount of products that can get the most value.	E, J

The study found that when players think that the number of virtual currency in the account is not sufficient to get the favorite characters; players will purchase virtual products in the game. After players compare different plans, they agree that standard price of the virtual currency is too expensive, so most players will not choose to buy the virtual currency directly, but look for a more favorable solution.

Since players were students when they had been interviewed, there was no stable source of income to support them purchased virtual products, micropayments became the most common payment method for players, and the price became a reasonable factor for most players. On the other hand, the way to improve character ability in the game is to use rare material to strengthen, some players will make micropayments in order to obtain rare materials. For them, this behavior is more like buying materials, and the virtual currency as bonus. There are also a few players who believe that high price performance ratio is determinant attribute. They think that although the price may be slightly more expensive, it will be of great help to the game, and once they buy, they don't have to worry about the progress of the game for a while, which is a very cost-effective investment.

In summary, players tend to choose the loot box containing the character and few old characters. As for the purchase of virtual products, the price is the main choice. Players hope to find a high price performance ratio at an acceptable price also be accompanied by gifts and bonus.

4.4 Choice

This study explores whether factors such as important people's attitude, purchase decisions, unplanned purchases, and unpredictable situation can affect players' purchase behavior.

Table 5
Factors affecting purchase behavior

affecting factor	Factor introduction
important people's attitude	Other people who have a strong influence on the player's judgment, such as friends and family.
purchase decisions	The decision made by the player when purchase, such as how much to buy and when to buy.
unplanned purchases	The player did not act as expected, such as the actual number of buy loot boxes exceeded the originally expected upper limit.
unpredictable situation	Players encounter unpredictable and irresistible situations, such as unstable network connections and game bugs.

The study found that players buy loot boxes after fully evaluation, but when the result is different from their own thoughts, most players will still focus on their own ideas, and only few players' purchase intentions are reduce (C, F, I). In addition, players purchase virtual products is determined by themselves, and will not be discussed.

Although the players have the habit of storing the virtual currency before the event, the desired character is usually not obtained in single loot box opening. In the case of limited virtual currency, players tend to buy loot boxes when the character's probability is doubled. The maximum number of loot box bought during one event that some players can accept is fifteen (A, B, C, D, E, G, I), but some players think it is twenty (F, H), or even twenty or more (J). Unless it is a very favorite character of the player, they will less likely buy the loot box beyond the expected limit, the exception is the official launch of the limited-time Meta characters, when all players are willing to buy loot boxes until guarantee.

If the number of virtual currency owned by players does not meet the expectations, or the number of bought loot boxes exceeds the expected number. There will be attractive only accompanied with the official offer by game business owner.

Only some players have experience to encounter failure of the network during the purchase process due to network instability or game bugs (B, D, E, J). If this happens, half of the players will completely drop the willingness to purchase (A, B, C, E, I).

It can be conclude as most players make decisions based on their own subjective ideas. Before the event, players will be prepared in advance. If there is insufficient preparation or unplanned purchases, the willingness to purchase virtual products will increase dramatically. In addition, the impact of the unpredictable situation is huge for the players.

4.5 Outcomes

This study divides satisfaction into single satisfaction and overall satisfaction based on the results of the interview.

Single satisfaction refers to the player's evaluation of the results of a single opening. If the opening is awarded the player's favorite character, the single satisfaction will be

positive. Conversely, if the opening is not awarded the player's favorite character, the single satisfaction will be a negative evaluation.

Overall satisfaction refers to the player's evaluation of the overall performance. The overall performance can be understood as the default limit of the number of openings in each player's mind. The overall satisfaction of the characters drawn before the upper limit will be positive. Conversely, if you don't get any player's favorite character when you reach the upper limit, it means the overall satisfaction is negative.

This study found that the maximum of bought loot boxes for the tolerance of players is fifteen (A, B, C, D, E, G, I). The negative single satisfaction before fifteen times has little effect on the player's willingness to buy loot boxes. However, once the number of bought loot boxes exceeds fifteen times, the willingness to buy loot boxes will be greatly reduced, and overall satisfaction will be considered negative. At this time, the player's enthusiasm for the game will also be reduced, but only during the time of the event, the overall satisfaction of the event will not affect the next event, the players believe that the overall satisfaction does not affect each other.

In short, a single satisfaction will not cause too much impact on the willingness to buy loot boxes until the limit is reached, and the overall satisfaction is an indicator that the players judge the overall performance of this event, which may affect the loyalty of the player to the game.

5. Conclusion

This study explores the decision process for players to purchase loot boxes is summarized the findings as below and the recommendations will be:

The loot box system is interlocked with the game. The core of the game is clear the level. The level needs to organize the team to clear. The team needs characters matching. Characters are obtained by the loot boxes. Loot boxes need to pay the virtual currency. The virtual currency can be obtained by clearing level, official events or purchasing virtual products. This study suggests that game developers can introduce more complicated levels. Players will discuss with others in order to clear the level. The desire to buy loot boxes will be deepened during the discussion, and the officially launched characters must be more distinctive, making the team more diverse. So that players have more possibilities to clear levels. In addition, the event of giving virtual currency can be increased, and players are used to open loot boxes to maintain the player's passion for the game.

The way that players get information is mainly friends and the Internet. If it is related to loot box, the contents in the loot box are the most important part of the players. This study suggests that game developers can place the content of the loot box in an obvious place in the announcement, so that players can see the prize of this loot box at a glance. Another thing to note is that players don't like announcements occur every time they log in, so game developers can consider changing to automatically announcement when the player first logs in, and then remind every three days.

The appearance and ability of the character is an important factor influencing the player's choice of the loot box. The debut of the new character will prompt the player

to select the loot box containing the character. As for the price, it is the most important factor for student players when purchasing virtual products. At present, most students pay mainly for micropayments. Therefore, this study suggests that game developers will set a new and powerful character as a grand prize in the new loot box during the event and simultaneously launch cheap and cost-effective products for players to purchase.

Players usually buy loot boxes when date of double probability and the number of buy are about fifteen times. Therefore, this study suggests that game developers will adjust the Probability of obtain the character so that players can obtain the character in 15 times. The number of guarantees can be changed to twenty-five times, so that players who have not obtained the favorite character have stronger intentions to buy loot boxes until guarantee. In addition, game developers should also pay attention to the problem of system bugs. If the situation that causes the purchase to fail is the problem of the game itself, players will lose the trust of the game.

Players buy loot boxes almost no more than the expected limit; most players have a limit of fifteen times. If the character has not yet been obtained when the limit is reached, players will assume that this is a failed overall performance and the loyalty to the game will decrease. This study suggests that game developers adjust the Probability of obtain the character and allows players to have a good gaming experience after the event.

The group currently discussed in this study is students who have purchased virtual products. It is suggested that follow-up studies can be conducted for different groups of players. Or the results of this study can be further explored with the students to sort out the importance of various factors to the student group.

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Contact email: williamhsu0516@gmail.com