

Empirical study on perceived behavior of Generation Z towards Mobile game during Covid-19 Pandemic: A structural Equation Modelling Approach

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Abstract

Since the Philippines is currently under lockdown due to a pandemic, this study was conducted to determine how much time Generation Z (Gen Z), which was born between 1997 and 2012 and ranged in age from 6 to 24, spent playing multi-player games on smartphones and how satisfied they were with their performance. During these times, this group called Gen Z was among the population which utilizes the use of mobile technology, it is constantly developing and evolving when it comes to the mobile game industry.

Mobile games are any games that may be played on a portable device such as a smartphone, tablet, or other similar device. Multiplayer Online Battle Arena Games (MOBAG) is one of the popular smartphone games among Generation Z. The researchers employed Structural Equation Modeling (SEM) and the Self-Affirmation Theory (SAT) to determine the satisfaction of CODM to Generation Z in the setting of this study. The researchers conducted a poll and received 250 legitimate responses from Generation Z, with most of the participants being female. The researchers discovered that the influence of self-worth on playtime has the biggest path coefficient, which is displayed in the outcome section, where the study model's factor loadings are displayed. As the researchers determined the impact of self-worth with playtime having a high impact relationship, self-worth does not significantly relate to satisfaction. The researchers also showed their data fits to the given model table (GFI = 0.86, CFI = 0.92, AGFI = 0.82, TLI = 0.92, IFI = 0.93, RMSEA = 0.068, CMIN/DF = 2.9).

Keywords: COVID-19, Esports, Satisfaction, Structural Equation Modelling

1. Introduction

The Philippines marked down its first anniversary of strict lockdown last March 16, 2021. The coronavirus 19 (Covid-19) has affected the Philippines and up to this moment, there are 812,760 numbers of coronavirus cases [1].

The government has ordered lockdown restrictions under Enhanced Community Quarantine where residents must be in their home, except for Authorized Persons Outside Residences (APOR): the employees and workers involved in the manufacturing the essential products, food preparation insofar take-out and delivery services, government officials [2].

Persons aged 20 years old below are not entitled to go outside their homes. Generation Z is called the newest and the youngest generation as of now, they are born from 1997 to 2012 with an age of 6 years old to 24 years old [3]. The influence and central part of this generation is the technology, because of this pandemic majority of the activities are online and using technology. Some of the activities are online classes, meetings, orientations, and games. These people who are part of Generation Z have the capability to adapt to the newest technology and use it without spending their too much time to learn the technology.

Smartphone features are more advanced and upgraded for computing power and connectivity than the usual phones [4]. These smartphones are being use for the satisfaction of online gaming and most of the companies are innovating phones to be classified as the best online gaming phone. The approximate numbers of smartphone users in the Philippines as of 2019 was 74 million, it is calculated that by 2025 there would be

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around 90 million smartphone users [5]. The Call of Duty: Mobile (CODM) is one of the most played multiplayer online battle arena games (MOBAG) in the Philippines. This fast-paced shooting game is only available for Android and IOS.

The highest-rated mobile game was released in October 2019 and it was developed by TIMI Games also, it is actively marketed by Activation. Call of duty awarded as “best mobile game” in the Game Awards 2019. The game has reach over 300 million downloads and it was reported by Activation on October 22, 2020 [5]. The game consisted of more than a half dozen features or modes that include Zombie mode, Capture the flag, Team death match, free for all, Domination, Search and destroy and the battle royale [6].

The main concept on how to play the CODM is the First-Person Shooter Mode, or they called it FPS. You can choose what mode or match you should play; In Multiplayer, you can choose Ranked Match, Non-Ranked Match, and Battle Royale. They installed the on-screen buttons; you can even edit your own button where you want to put the movements like tossing the grenades. In the Multiplayer, you can choose the modes of what you want to play. In the Battle Royale, you can play solo or with the squad (two-man, four-man squad), you can choose where to land on the map, the map is shrinking as time goes by and last team standing will be the winner of the game [6]. The ranking in the Call of Duty: Mobile is divided into two parts which are the Multiplayer and in the Battle Royale. CODM Players usually choose to rank up in the Multiplayer due to shorter time of gameplay in Battle Royale. The rank tiers in Call of Duty: Mobile are classified into 6 tier ranks; Rookie, Veteran, Elite, Pro, Master, and Legendary. Rookie is the lowest tier rank, and Legendary is the highest tier rank [7]. In playing Call of Duty: Mobile, there are four main positions which are the Slayer, Objective, Anchor, and Support. Each position is very important and has different roles to do in the game [8].

This mobile game is playable online; you can access all the features or modes by using mobile data or internet connectivity [6]. This game was considered as E-Sports because it uses technology specifically smartphones and computers to access this game.

The first official E-sports tournament of Call of Duty: Mobile World Championship 2020 Tournament with the collaboration with Sony Mobile conducted online qualifiers starting from April 30, 2020 to May 25, 2020 [9]. The prize money for the tournament was about more than \$1 Million [10]. The Philippines won 1st Place against Thailand from the Call of Duty Mobile World Championship 2020, this tournament run from September 28 to October 04, 2020 [11]. This study focuses on determining the satisfaction and the playtime of the Filipino Generation Z during Coronavirus-19 by using Structural Equation Modeling (SEM) imposition the Self-Affirmation Theory (SAT). Currently, Philippines are still suffering from the COVID-19 Pandemic that's why Generation Z has a lot of time to consume in online games while at their home. Aside from playing and enjoying online games, they can also join E-sports to show their talents.

2. Methodology

A. Data Collection

Due to covid-19 or the global pandemic, the researchers have decided to gather data through online survey. With the use of Google forms, Generation Z participants are able to access the questionnaire prepared by the researchers. To encourage Generation-Z Call of Duty Mobile gamer, the research team use the social media platform such as Facebook and messenger sending the link of online survey via private message, group chats and group page. In order to qualify valid data of this research, the participants should be in Generation Z who are playing Call of Duty Mobile and is currently playing it until this pandemic.

B. Sample Profile

This research has a total number of 250 participants who are valid MOBAG: Call of Duty Mobile players under the Generation Z. Most of the participants are female which were one hundred twenty eight (51.2%) and one hundred twenty two of male (48.8%). The largest number of the participants falls under the ages of 17 to 20 years old with the quantity of one hundred eighteen (47.2 %). Also, 105 participants under the ages of 21 to 24 years old (42%), 25 participants under the ages of 13 to 16 years old (10%) and 2 participant under the ages of 9 to 12 years old (0.8%) are added. In terms of educational attainment of the participants, the highest number is one hundred thirty four from university/ college students (53.6%). Also, 90 participants are high school/ senior high school students (36%), 24 participants are university/ college graduate (9.6%) and 2 participant for elementary student (0.8%) are added. The participants also reported their weekly playing hours.

Most of the participants were playing MOBAG: Call of Duty Mobile less than 7 hours per week have a quantity of one hundred seventy-nine (71.6%). Also, 50 participants were playing 7 to 14 hours per week (20%), 11 participants were playing 21 hours above per week (4.4%) and 10 participants were playing 15 to 21 hours per week (4%) are added. The participants also reported their years of experience in playing Call of Duty

Mobile. Majority of the participants with the number of 123 has a less than 1 year experience of playing (49.2%), 104 participants has 1 to 2 years' experience of playing (41.6%) and 23 participants has 3 years above experience of playing (9.2%). In addition, most of the MOBAG player participants are from National Capital region which were two hundred one, one participant is from Region 1, sixteen participants are from Region 3, seventeen participants are from Region IV-A, one participant are from Region 5, one participant are from Region 6, one participant are from Region 7, one participant are from Region 8, eight participants are from Region 11, one participant are from region 12 and lastly, two participants are from Region 13. In table 1 shows the participant's summary of demographic profile.

Table I: Demographic Profile Of Participants

<i>VARIABLE</i>	<i>CATEGORY</i>	<i>NUMBER (N)</i>	<i>PERCENTAGE</i>
Sex	Female	128	51.2
	Male	122	48.8
Age	9 to 12 years old	2	0.8
	13 to 16 years old	25	10
	17 to 20 years old	118	47.2
	21 to 24 years old	105	42
	Elementary student	2	0.8
Education	HS/ SHS student	90	36
	College Student	134	53.6
	College Graduate	24	9.6
Weekly hours of spent in Playing Call of Duty	Less than 7 hours	179	71.6
	7 to 14 hours	50	20
	15 to 21 hours	10	4
	21 hours above	11	4.4
Years of Experience	Less than 1 year	123	49.2
	1 to 2 years	104	41.6
	3 years above	23	9.2

<i>LOCATION</i>	<i>CITY</i>	<i>NUMBER (N)</i>	
NCR	PARANAQUE	79	
	TAGUIG	92	
	MANILA	15	
	MAKATI	5	
	QUEZON CITY	5	
	CALOOCAN	1	
	VALENZUELA	1	
	LAS PINAS	2	
	PATEROS	1	
	PANGASINAN	1	
	REGION 1	BULACAN	13
		PAMPANGA	2
	REGION 3	TARLAC	1
LAGUNA		5	
REGION IV A	CAVITE	9	
	ANTIPOLO	3	
	BICOL	1	
REGION 5	NEGROS OCCIDENTAL	1	
REGION 6	BOHOL	1	
REGION 7	LEYTE	1	
REGION 8	DAVAO	8	
REGION 11	KORONADAL	1	
REGION 12	SURIGAO DEL SUR	2	

C. Theoretical Framework

The research framework is based on Self-Affirmation Theory (SAT). Based on Sherman and Cohen, an individual can be motivated in terms of maintaining its self-worth [12]. To establish the framework of this study the researchers linked the three primary needs with the SAT known as; Autonomy, Competence and

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Relatedness. The Independence, Delightful, Playing Time and Satisfaction are added to assess if SAT and this research framework would identify the behaviour of CODM players during the pandemic.

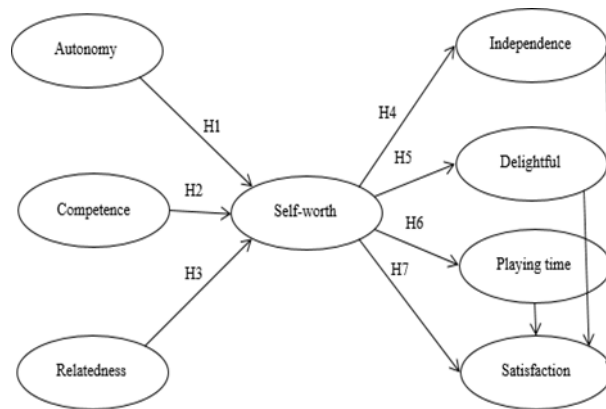


Fig. 1. Research Framework

D. Hypothesis Development

The researchers applied SAT to identify the Playtime and Satisfaction of each CODM players based on the gathered data from the participants with the use theoretical framework provided.

Autonomy is described as the ability of a person to have its own decision making in a specific event. In playing Call of Duty Mobile, each member will decide which character and weapon they will choose before the game starts. Agreeing to the study of Steele, SAT will be noticed if an individual would feel its self-worth if they can choose things on their own [13]. Therefore, the researchers conclude:

H1: Autonomy is associated to self-worth.

Competence is described as the capability of a person to make something successfully. Based on the framework of this research Competence gains the game enjoyment and will guide to appreciate a person's self-worth. After playing CODM, each player will be ranked based on their performances. For example, a particular player got an award of MVP. Therefore, the researchers conclude:

H2: Competence is associated to self-worth.

Relatedness is described as the ability of a person to build connection with other players or within the squad and this is an important factor in self-affirmation [14]. Call of Duty Mobile has a feature were a player can chat or have conversation with the other players. Therefore the researchers conclude:

H3: Relatedness is associated to self-worth.

Independence is described as the ability of a person to play alone or stand on their own and without the support of anyone [12]. Before playing an individual can choose as a solo player, he/she will fight against another squad or group and needs to survive alone. Therefore, the researchers conclude:

H4: Self-worth is associated to Independence.

Delightful is described as the connection of the player to the game and towards other players [12]. This is defined as the pleasure or gratification that a player would feel while playing CODM. Before the game starts, a player should choose a particular game mode to play either ranked match, or multiplayer or battle royale. These game modes have cores such as death match, domination, and search & destroy and so on. Therefore the researchers conclude:

H5: Self-worth is associated to Delightful

Playtime is described as the time of an individual where they are motivated to play [12] . According to Alha, if an individual is having a good performance to play the game players are winning, there is a high tendency that they will play more. Therefore the researchers conclude:

H6: Self-worth is associated to Playtime

If players are winning consecutively, it will leads to gaining their own worth as an individual. Therefore the researchers conclude:

H7: Self-worth is associated to Satisfaction.

The researchers are determined to identify if the playing time also affects the satisfaction of a player with the playing time of which an individual motivated to play Call of Duty Mobile. Therefore, the researchers conclude:

H8: Playtime is associated to Satisfaction.

E. Questionnaire

The researchers developed a series of questionnaire with the use of framework provided to determine the playtime and Satisfaction of players during the Covid-19 pandemic. The questionnaire consists of 9 sections consist of: (a) Personal Information of players (age, gender, educational background, weekly hours of spent in playing, years of experience in playing and location) (b) Autonomy (c) Competence (d)

Relatedness (e) Self-worth (f) Independence (g) delightful (h) Playtime (i) Satisfaction. The researchers used 5- point scale to measure the satisfaction in every question.

Table II. Questionnaire for Latent Constructs

Construct	Items	Measures	Source
Autonomy	AU1	I feel that I have freedom in choosing my own character and weapon	Chen et. al. (2015)
	AU2	I feel my choices express who I am	
	AU3	I feel my game position choices (Slayer, Anchor, Support and Objective) are right	
	AU4	I feel that my decisions reflect what I really want	
Competence	CO1	I feel confident that I will win in every match	Chen et. al. (2015)
	CO2	I feel capable at what I do	
	CO3	I feel I can successfully play my role in match	
	CO4	I feel competent to achieve my goals in the match	
Relatedness	RE1	I feel that I am connected to my teammates in playing Call of Duty	Chen et. al. (2015)
	RE2	I can feel the connection with others players in playing Call of Duty	
	RE3	I feel that Call of Duty makes me and my friends more connected	
	RE4	I am more motivated to play Call of Duty if my friends invited me to be a squad especially in ranking match	
Self-worth	SW1	I feel my worth while playing Call of Duty	Liao (2019)

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	SW2	I feel that I can also do the skills like other players have	
	SW3	I feel that Call of Duty gives a positive attitude on myself	
	SW4	I feel that I can help others to improve their game play because of my experience	
Independence	IN1	I feel that I have freedom in playing Call of Duty without a squad	
	IN2	I feel I can win the game on my own	
	IN3	I feel that it is more fun to play as an Individual	
	IN4	I feel more confident in playing Call of duty as a solo player rather than playing with unknown	
Delightful	DE1	I feel playing call of duty gives me positive vibes	
	DE2	I feel that Call of Duty reduce my stress	
	DE3	I feel always excited in playing Call of Duty	
	DE4	I feel that I can share my positive vibes to my teammates while playing	
Playtime	PL1	Quarantine makes me spend more time in playing Call of Duty	Liao (2019)
	PL2	I have the eager to play more especially if I am winning in every match	
	PL3	I want to stop playing when my teammates is not cooperative	
	PL4	I want to stop the game if I have unstable internet	
Satisfaction	SA1	I am satisfied while playing Call of Duty	
	SA2	I am satisfied when I win as MVP	
	SA3	I am not satisfied when I play in a short period of time	
	SA4	I am not satisfied if I Am losing, and it reduce my rank	

F. Data Analysis

The researchers used AMOS 22 software to calculate Structural Equation Modeling (SEM) and to evaluate the utmost likelihood. The researchers also used confirmatory factor analysis to determine the measurement of: Adjustment Goodness of Fit Index or AGFI, Comparative Factor Index or CFI, Root Mean Square Error of Approximation or RMSEA, and Tucker Lewis Index or TLI analyze has validity and reliability.

3. RESULTS

The figure below shows the SEM results for assessing the satisfaction and playtime in playing Call of Duty Mobile

during COVID-19. The hypothesis of this research was analytically observed based on our online survey that were answered by our participants. With the help of AMOS and SPSS software, we can determine the factor loadings, which are also determining the path coefficient to see the relationships of our model. Based on the figure, the path coefficients of our model show positively related to each other specifically in self-worth in which it is positively related to playtime (= 0.64, P <0.001). While in autonomy, competence and relatedness are also positively related to self-worth respectively (= 0.97, 0.45, 0.64, and p = 0.001, 0.001, 0.001). NoWe also added the Cronbach’s alpha that is to see the internal consistency of our measured constructs in which all values are greater than 0.70 which indicates a good reliability. On the second Table, it summarizes the path analysis of our SEM. Here, we can observe that all our paths with our latent variables are significant except with the relationship of self-worth to satisfaction. Furthermore, on the third table listed the model fit of our SEM. As we observed the given table, we can say that model fits our data (GFI = 0.86, CFI = 0.92, AGFI = 0.82, TLI = 0.92, IFI = 0.93, RMSEA = 0.068, CMIN/DF = 2.9)

Table III. Statistical Descriptive Results

Factor	Item	M	SD
Autonomy	AU1	4.43	.759
	AU2	4.07	.955
	AU3	4.05	.839
	AU4	4.07	.914
Competence	CO1	3.71	.991
	CO2	3.98	.861
	CO3	3.96	.870
	CO4	4.22	.749
Relatedness	RE1	3.96	.919
	RE2	3.82	.923
	RE3	4.35	.838
	RE4	4.45	.733
Self Worth	SW1	3.84	.965
	SSW2	3.96	.924
	SW3	3.78	.905
	SW4	3.84	.963
Independence	IN1	4.05	.866
	IN2	3.86	1.005
	IN3	3.28	1.186
	IN4	3.49	1.137
Delightful	DF1	4.05	.866
	DF2	4.06	.956
	DF3	4.12	.832
	DF4	4.13	.837
Play Time	PL1	4.03	1.018
	PL2	4.39	.741
	PL3	3.52	1.123
	PL4	4.31	.952
Satisfaction	SA1	4.28	.840
	SA2	4.55	.726
	SA3	3.43	1.010
	SA4	3.73	1.100

Table IV. Path Analysis For Sem

Estimate	S.E.	C.R.	P
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Selfworth	<---	Autonomy	.62	.12	5.30	***
Selfworth	<---	Competence	.38	.07	5.55	***
Selfworth	<---	Relatedness	.39	.07	5.72	***
Independence	<---	Selfworth	.40	.09	4.37	***
Delightful	<---	Selfworth	.89	.11	7.83	***
PlayingTime	<---	Selfworth	.73	.13	5.74	***
Satisfaction	<---	Selfworth	-.13	.21	-.59	.56
Satisfaction	<---	PlayingTime	.77	.19	4.13	***
Satisfaction	<---	Delightful	.21	.13	1.67	.10
Satisfaction	<---	Independence	.04	.09	.51	.61

Table V. Model Of Fit

Goodness of Fit	Estimates	Range	Reference
Goodness of Fit Index (GFI)	0.89	>0.8	Gefen.et al (2000)
Comparative of Fit Index (CFI)	1.00	>0.90	Hair 2010
Adjusted Goodness of Fit (AGFI)	0.87	>0.80	Gefen.et al (2000)
Tucker Lewis Index	.74	>0.90	Hu and Bentler (1999)
Incremental Fit Index (IFI)	1.0	>0.90	Hair (2010)
Root Mean Square Error of Approximation	.09	<0.08	MacCallum et al (1996)
Minimum Discrepancy (CMIN/DF)	2.45	<5	Wheaton et al (1977)

4. Discussion

According to the results mentioned above, the players' playtime is influenced by their self-worth. The researchers offered a theory based on study by Liao and colleagues, who found that if a player can experience their self-worth while playing, they are more likely to deliberately and regularly engage in the game. [14].

The self-worth of individual mobile players has no influence on their satisfaction when playing a mobile game. While everyone has their own sense of self-worth, the researchers feel that their degrees of enjoyment in their game do not complement one another. [15]. According to the researchers findings, self-worth is positively related to playtime but is not significantly related to satisfaction.

The study also shows that Self-worth and independence are not associated with satisfaction. Playing alone and winning the game does not satisfy the player and winning consecutively does not gain their own worth as an individual. The results are somehow same with the mentioned study where in self-worth does not complement with the satisfaction of the gamer.

The goal of the study is to determine how much time and enjoyment Mobile Game players have during a pandemic. This research can add to the concept that SAT theory may be used to forecast the activities of mobile game players through the application of Self-Affirmation Theory and statistical analysis utilizing Structural Equation Modeling (SEM)..

The study is only limited to 250 Gen Z participants who are actively playing Call of Duty Mobile and the game itself. To acquire additional findings, the researchers suggested expanding the number of participants and introducing other games that are similar to the gameplay.

5. Conclusion

The researchers conclude that the findings of this study relating to the playtime and satisfaction of the mobile gamers were defined and explained using Self-Affirmation Theory (SAT) and by analyzing the model through SEM, the result shows that the model describes the MOBAG players fits the data. In addition to that, it indicates that self-worth has a great impact on satisfaction as well as satisfaction has a positive effect in self-worth of the mobile players of this game during pandemic. As this study is conducted while the Philippines is under lockdown due to COVID-19, the researchers eagerly provide additional evidences in application of SAT with SEM on how Gen Z-ers behavior on playing MOBAG : Mobile during health crisis

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