Investigation of the relationship between university students' mobile gaming motivations and loneliness levels

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Abstract

Background and Study Aim	The aim of this study is to determine the mobile game motivations and loneliness levels of university students and to evaluate the relationship between them.
Material and Methods	In the study, the "Mobile Game Motivation Scale" developed by **Üstün ve Öz** and the "UCLA Loneliness Scale" developed by Russell et al and adapted to Turkish culture by Demir were used as data collection tools. 365 (N_{women}:140; N_{men}:225) university students participated in the study on a voluntary basis. SPSS package program was used in the analysis of the data, and it was tested with parametric tests.
Results	As a result of the study, in favor of men in all Mobile Game Motivaton Scale and sub-dimensions according to gender, significant differences were found in the loneliness scale against those who have a higher income level than their monthly income. It can be said that the game motivation increases as the game playing time and weekly free time increase. In addition, a low level of positive correlation was found with Mobile Games Motivation Scale and UCLA Loneliness Scale.
Conclusions	The researchers conducted their studies on the concept of 'motivation', which is considered to be a major deficiency in studies in the field of social internet in general and mobile games in particular, and 'loneliness', which is accepted as a universal problem, and reached generalizable results on generation Z undergraduate students. The researchers presented a different perspective to the literature by examining the relationship between 'loneliness' and the structure they created through the sub-dimensions of Mobile Games Motivation Scale 'developmental tasks', 'escape and competition' and 'mobile flow'.
Keywords:	digital leisure, mobile games, loneliness, Z generation

Introduction

Playing games is considered to be as old as human history. Game activities, which were considered as a formal way of survival in the beginning, have diversified, deepened and become a tool of different experiences. Even religious rituals appear within the framework of a game or in the following game-based behavioral processes [1]. While playing games, humanity have tried to create a systematic and regular chain of activities rather than simple and primitive actions. Even in the most primitive periods of humanity, there are special areas and arenas reserved for playing games [2]. This means that the game is not only an activity that is played, but also an activity that brings people together and makes them follow itself. Although this activity served political or personal interests in some periods, it never lost the instinct of struggle in its soul. In fact, people have sometimes struggled with themselves, sometimes with nature and sometimes with nature's products through games [3]. This instinctive behavior has attracted the attention of many philosophers, and games have become an indirect or direct means of explaining many behaviors. Schiller speaks of a dual

feature existing in human nature, which is defined as senseous and formative. In response to these two sides, two impulsions occur in human. Senseous and formative impulses define human qualities to the extent of their dominance. The fact that the senseous impulse dominates the formative impulse in human nature leads people to a savage nature, and the opposite leads to a barbaric nature. This is where the culture we live in comes into play and combines these two opposite reactions in harmony. This act of harmony can only be realized through art. With the experience of beautiful actions, we can feel ourselves materially and know mentally [4]. The combination of these two impulses with such harmony enables the emergence of a third impulse in human nature. This third impulse is called the 'play impulse' [5]. Many philosophers have dealt with art and play from a common framework. Both art and play liberate people and take them away from daily pressures and fears [6]. Man plays when he is a human in the true sense of the word, and he becomes a fully human only when he plays. Thus, people can experience complete freedom in the joyful land of appearance and play, getting rid of both physical and moral strains.

Today, play sometimes shows itself as a tool of

education and sometimes as an aspect of socialization [7, 8, 9, 10]. Regardless of the underlying motivation, people see playing as a need, and they can meet this need in various ways. Although the play arenas continue to exist in the modernized form of the old times, different physical and personality traits have made the functions of these arenas available to a limited minority. With the motivation to play, today's people benefit from digital technologies as the easiest playground to reach [11, 12, 13]. Rapid transformations in digital recreation areas facilitate people's instinctive behavior of playing. It is reported that there are 4.78 billion mobile phone users registered in the world as of 2020 [14]. Most of these mobile phones are smart phones. It has been concluded that these smartphone users spend an average of 4.8 hours a day on applications on their phones. In these applications, social media and game applications are in the lead. According to the study conducted by TUIK (Turkish Statistical Institute) on leisure time, when the time allocated to household and family care is analyzed by working status and gender, it has been observed that women spend an average of 3 hours and 31 minutes a day, while working men spend 46 minutes [15]. Based on these results, it can be said that family members spend more time on mobile phones than they spare for each other [16, 17, 18].

At this point, two different views arise. The first view belongs to those who find technology negative and argue that people are dragged into a new addiction and loneliness, and the second view belongs to those who find technology positive and advocate that people find opportunities for freedom and new experiences through mobile devices. Although it is an unconfirmed opinion to attribute the cause of loneliness only to mobile device technologies, it is obvious that it is an important problem for humanity [19, 20]. As a result of research on societies that are isolated, some countries with large economies take action and make various initiatives. Therefore, it was stated that Tracey Crouch, who was in the cabinet as the Minister of Sports and Society in the UK in 2017, would also serve as the minister of loneliness, a Commissioner for Loneliness in Berlin, the capital of Germany, was proposed to be established and The Red Cross defined the problem of loneliness as a 'hidden epidemic' [21]. It is known that loneliness continues to be an important problem, especially among the young population, even in Denmark, Finland, Norway, Sweden and Iceland, which rank first in happiness indexes. Japanese engineers are trying to find a solution to this problem by designing robots that will make the lonely happy. The start-up company Groove X announced the name of the robot, which resembles a pet and befriends with its owner, as 'Lovot', a combination of the words 'love' and 'robot', which means love in English [22]. Using artificial intelligence technology, the penguin-like robot can move thanks to its wheels, react when called or loved, and fall asleep when hugged and patted [23]. As a result, loneliness appears as a product of daily life, regardless of a certain age group, income, gender, status or culture. Some policies deal with this situation within the framework of social solidarity, while others try to solve the problem with technological means. In their studies, the researchers will try to examine the relationship between mobile gaming motivations and loneliness.

Material and Methods

This study carried out by considering the survey model, has a cross-sectional feature. The ethical procedure of the study was supported by Selcuk University Non-Interventional Clinical Research Ethics Committee with the decision dated 28.03.2022 and numbered E-40990478-050.99-261033.

Participants

The universe of the research consists of students studying in Turkey in the 2021-2022 academic year. The sample group of the study consisted of 373 students from various faculties who were selected by convenience sampling method, studied at the central campus of Selçuk University, regularly participated in mobile games, and participated in the study voluntarily. The criteria for inclusion in the study are to have knowledge about mobile games and their applications. Exclusion criteria were determined as not playing mobile games, not knowing about them, and not regularly participating in any recreational mobile game applications. For this purpose, it was questioned whether they participated in their mobile activities for recreational purposes before participating in the study.

Research Design

The data collection process was collected in the units located on the main campus, in the social activity areas, during or outside the lessons. Individuals interested in or participating in the Mobile Game were given preliminary information about the study, they were promised that their personal information would be protected, and the scale was applied on a voluntary basis. It took 5-7 minutes per person to complete the scale.

Instruments

Mobile Game Motivation Scale [MGMS]

The "Mobile Game Motivation Scale (MCMS)" developed by Öz and Üstün [24] was used to determine the Mobile Game motivations of the individuals participating in the research. The options in the scale range from as "1= strongly disagree" to "5= strongly agree". The scale was designed with 24 questions and 3 sub-dimensions to determine the motivation of mobile game participants. In the "Developmental Tasks/Self Skills" sub-dimension, it is to define the building blocks for the prediction of social and personal characteristics, and in the

"Escape and Competition" sub-dimension, the individual creates a competitive environment through mobile games as a modern time argument to show a certain behavior and evaluates it as a means of escape. In the "Mobile Flow" sub-dimension, it is evaluated as a reflection of the optimal accessibility of the individual's high amount of pleasure from the experience. The reliability coefficient in the original scale development study was calculated as .955. A minimum of 24 and a maximum of 120 points can be obtained from the scale. The higher the score within the sub-dimensions, the more effective the motivation feature of that factor. The overall reliability coefficient of this study was calculated as .975, Developmental Tasks/Self Skills .946, Escape and Competition .948, Mobile Flow .937. Internal consistency values of the overall scale and its sub-dimensions show that the scale is sufficient in terms of reliability.

UCLA Loneliness Scale

It was developed by Russell et al. It is a scale consisting of 20 items, 10 of which are straight and 10 are coded in the opposite direction. In each item of the scale, a situation expressing feelings or thoughts about social relations is presented and individuals are asked to indicate how often they experience this situation on a four-way scale. A high score is accepted as a sign that loneliness is experienced more intensely. Since the scores for each item in theory vary between 1 and 4, the lowest score to be obtained from the scale is 20 and the highest 80 [25]. The overall reliability coefficient of this study was calculated as .67.

Statistical Analysis

In the analysis of the data, descriptive statistical methods frequency (n), percentage (%), arithmetic mean (X) and standard deviation (SD) were used for personal information. Normality analysis was used to determine the test to be used in order to reveal the statistical significance of the participants according to the Mobile Game Motivation Scale and UCLA loneliess scale and its sub-dimensions, according to the demographic variables. Whether the data showed a normal distribution was checked with the Kurtosis - Skewness coefficient range, and it was determined that the data were normally distributed, since the said range did not exceed +2.0 and -2.0 values [26, 27, 28]. Since the data were normally distributed, independent group t-test was used for pairwise cluster comparisons, and One-Way Analysis of Variance (ANOVA) was used for more than two cluster comparisons. The level of significance in the study was taken as 0.05.

Results

Participant characteristic has been given at table 1.

Reliability analysis is carried out to test whether the statements in the scales are consistent with each other and whether all the statements measure the same subject [27, 28, 29]. In the reliability analysis, the Cronbach's Alpha (α) coefficient value varying between 0-1. If it is between 0.00-0.40, the scale is not reliable. It is considered to be a low reliability scale between 0.40 and 0.60, a highly reliable scale between 0.60-0.80, and a highly reliable scale between 0.80-1.00 [27, 28, 30]. Accordingly, when the general alpha values of the exercise dependence scale were examined, it was determined that the overall internal consistency of the scale was high and the sub-dimensions were quite reliable (table 2).

Table 1. Participant Characteristic

Variables		n	%
Gender	Women	140	38,4
	Men	225	61,6
Monthly Income	<2500tl	115	31,5
	2501-5000tl	130	35,6
	>5001tl	120	32,9
Age	<20 age	122	33,4
	21-23 age	209	57,3
	>24	34	9,3
Working Status	part-time	100	27,4
	Full time	38	10,4
	Not working	227	62,2
Free Time (weekly)	1-3 hours	62	17,0
	4-6 hours	90	24,7
	7-9 hours	87	23,8
	10 and above	126	34,5
Gaming Time (weekly)	1-3 hours	293	80,3
	4-6 hours	50	13,7
	7-9 hours	10	2,7
	10 and above	12	3,3

Table 2. Descriptive statistics and reliability analysis results of the scales and dimensions

Scale and Sub-dimensions	X	SD	Cronbach Alpha
MGMS	61.71	26.91	0.975
Developmental Tasks/Self Skills	18.31	8.82	0.946
Escape and Competition	22.02	9.92	0.948
Mobile Flow	21.36	9.85	0.937
UCLA Loneliness	49.92	7.21	0.673

In order to determine whether the scores obtained from the MGMS sub-dimensions and the UCLA loneliness scale differ according to the gender variable, an independent sample t-test was used. When the results were examined (table 3), there was no significant gender difference in the UCLA loneliness scale (t=-0.321; p>0.05); MGMS

Developmental Tasks/Self Skills (t=-3.151;p<0.0), Escape and Competition (t=-2.208;p<0.01), Mobile Flow (t=-2.909;p<0.01) sub-dimensions and MGMS total (t =-2.915; p<0.01) a significant difference was found in favor of male participants in the mean scores.

In order to determine whether the scores obtained from the MGMS sub-dimensions and the UCLA loneliness scale differ according to the monthly income variable, a one-way ANOVA test was used. When the results were examined (table 4), there was no significant monthly income difference in the MGMS Developmental Tasks/Self Skills (F==2.463;p>0.05), Escape and Competition (F=2.552;p>0.05), Mobile Flow (F==0.312;p>0.05) sub-dimensions and MGMS total (F=1.510; p>0.05); a significant difference was found in favor of who have 5001 tl and above income participants in the

UCLA loneliness scale (F=8.444; p<0.05) scores.

In order to determine whether the scores obtained from the MGMS sub-dimensions and the UCLA loneliness scale differ according to the weekly leisure time variable, a one-way ANOVA test was used. When the results were examined (table 5), there was no significant weekly leisure time difference in the MGMS Developmental Tasks/Self Skills (F=1.827;p>0.05), Mobile Flow (F=2.298;p>0.05) and UCLA loneliness scale (F=8.444; p>0.05); MGMS Escape and Competition (F=4.380;p<0.01) sub-dimension and MGMS total (F=3.048; p<0.05) scores. significant difference was found in favor of who have 10 hours and above weekly leisure time according to 1-3 hours.

In order to determine whether the scores obtained from the MGMS sub-dimensions and the UCLA loneliness scale differ according to the weekly

Table 3. Comparison according to gender of MGMS and UCLA Loneliness Scale

Scale and Sub-dimensions	Gender	X	SD	t	p/ES
Developmental Tasks/Self Skills	Female	16,49	8,52	-3.151	0.00**/0.33
	Male	19,44	8,83		
Escape and Competition	Female	20,58	10,45	-2.208	0.02*/0.23
	Male	22,93	9,49		
Mobile Flow	Female	19,48	9,61	-2.909	0.00**/0.31
	Male	22,54	9,84		
UCLA Loneliness	Female	49,77	7,26	-0.321	0.74/0.03
	Male	50,02	7,19		
MGMS	Female	56,55	26,94	-2.915	0.00**/0.31
	Male	64,91	26,45		

*p<0.05;**p<0.01

Table 4. Comparison according to monthly income of MGMS and UCLA Loneliness Scale

Scale and Sub-dimensions	Income	X	SD	F	P/ES
Developmental Tasks/Self Skills	<2500tl	16,92	8,50	2.463	0.08/0.03
	2501-5000tl	18,49	8,82		
	>5001tl	19,44	9,01		
Escape and Competition	<2500tl	21,31	9,63	2.552	0.07/0.01
	2501-5000tl	21,12	9,56		
	>5001tl	23,69	10,44		
Mobile Flow	<2500tl	21,00	9,52	0.312	0.73/0.002
	2501-5000tl	21,15	9,93		
	>5001tl	21,94	10,13		
MGMS	<2500tl	59,24	26,06	1.510	0.22/0.008
	2501-5000tl	60,77	26,50		
	>5001tl	65,08	28,02		
UCLA Loneliness	<2500tl b	47,99	7,78	8.444	0.00**/0.04
	2501-5000tl	49,92	7,27		
	>5001tla	51,78	6,05		

*p<0.05;**p<0.01

game time variable, an independent sample t-test was used. When the results were examined (table 6), there was significant gaming time difference in the UCLA loneliness scale (t=-3.086p<0.01); MGMS Developmental Tasks/Self Skills (t=-5.064;p<0.01), Escape and Competition (t=--4.556;p<0.01), Mobile Flow (t=-5.427;p<0.01) sub-dimensions and MGMS total (t =-5.349; p<0.01) a significant difference was found in favor to who gaming 4 hours and above participants in the mean scores.

According to table 7 relationship between UCLA loneliness scale and MGSM and all sub-dimensions are low level and positive way.

Discussion

Loneliness is accepted as a disease that affects one out of every ten people worldwide and this rate is increasing day by day. It is a disease that spreads and deepens regardless of education, income, gender and race [31]. Studies show that loneliness increases the risk of death by 30% [32]. The developments in online networks in the last twenty years have caused social relations to be transferred to digital. However, the effects of

Table 5. Comparison according to weekly leisure time of MGMS and UCLA Loneliness Scale

Scale and Sub-dimensions	Weekly Leisure Time	X	SD	F	P/ES
Developmental Tasks/Self Skills	1-3 hours	16,59	9,67	1.827	0.142/0.01
	4-6 hours	17,43	8,68		
	7-9 hours	18,97	8,54		
	>10 hours	19,33	8,58		
Escape and Competition	1-3 hoursb	19,16	10,28	4.380	0.005**/0.03
	4-6 hours	20,49	9,68		
	7-9 hours	22,83	9,57		
	>10 hoursa	23,98	9,76		
Mobile Flow	1-3 hours	18,72	9,82	2.298	0.077/0.01
	4-6 hours	21,01	10,24		
	7-9 hours	21,78	9,39		
	>10 hours	22,63	9,75		
MGMS	1-3 hoursb	54,47	27,94	3.048	0.029*/0.02
	4-6 hours	58,94	27,12		
	7-9 hours	63,58	26,00		
	>10 hoursa	65,95	26,22		
UCLA Loneliness	1-3 hours	49,70	7,22	0.786	0.502/0.00
	4-6 hours	49,01	8,17		
	7-9 hours	50,32	5,75		
	>10 hours	50,42	7,40		

*p<0.05;**p<0.01

Table 6. Comparison according to weekly gaming time of MGMS and UCLA Loneliness Scale

Scale and Sub-dimensions	Weekly Gaming	X	SS	t	p/ES
Developmental Tasks/Self Skills	1-3 hours	17,1910	8,50732	-5.064	0.00**/0.66
	>4 hours	22,8793	8,66994		
Escape and Competition	1-3 hours	20,8867	9,58307	-4.556	0.00**/0.59
	>4 hours	26,6810	10,00942		
Mobile Flow	1-3 hours	20,0316	9,52004	-5.427	0.00**/0.71
	>4 hours	26,8087	9,38798		
UCLA Loneliness	1-3 hours	49,4518	7,50450	-3.086	0.00**/0.33
	>4 hours	51,8741	5,52376		
MGMS	1-3 hours	58,1092	25,87727	-5.349	0.00**/0.70
	>4 hours	76,3690	26,25463		

*p<0.05;**p<0.01

Table 7. Relationship Between MGMS and UCLA Loneliness Scale

Scale and Sub-dimensions		Developmental Tasks/Self Skills	Escape and Competition	Mobile Flow	UCLA Loneliness
MGSM total	r	0,929**	0,960**	0,932**	0,171**
Developmental Tasks/Self Skills	r	1	0,859**	0,777**	0,201**
Escape and Competition	r		1	0,845**	0,173**
Mobile Flow	r			1	0,112*
UCLA Loneliness	r				1

**p<0.01

digitalization on loneliness are still not based on a concrete basis. Since studies in the academic field are generally cross-sectional, opposite results can be obtained. However, some definite evaluations show us that individuals between the ages of 13-20 now devote less time to their social relationships compared to the previous generation [19, 20, 33, 34, 35]. It is not known how correct it is to directly connect the reasons to digital technologies, but the increase in studies on loneliness and the digital world will help us create a panorama at this point. As an instrument, digitalization differs in meaning when it is a means of interpersonal interaction or a means of escape or hideout. Studies support that the use of smartphones in individuals aged 12-18 has increased from 25% to 95% in ten years, and that most of these individuals are constantly connected to the internet [36]. This widely used network also develops some sociological and psychological phenomena along with it. Depending on these developments, there are opinions shaped around displacement and stimulation hypotheses regarding social internet use [37]. According to studies defending the displacement hypothesis, offline social relationships leave their place to online relationships and push the individual to loneliness. Some studies based on these explanations show that digitalization contributes to loneliness. According to studies defending the stimulation hypothesis, digitalization reduces loneliness by developing and diversifying relationships. Studies on generation Z show that digitalization has an important place in communication and interaction [34, 35, 38, 39].

Mobile devices are the most important actors of the digital world. It is estimated that 5.5 billion people worldwide have mobile phones and 66 billion GB of data traffic occurred in the first quarter of 2021 alone [14]. Application developers are constantly adding to the volume of this data traffic. Mobile games are also the locomotive of these applications economically. With an annual investment of approximately 150 billion dollars, mobile games hold the leadership in digitalization. According to the Gaming Industry 2019-2020 Q1 Report, it is estimated that 2.7 billion people play mobile games. This economic gain in the mobile game market and the rapid increase in the number of users are adding

value to the sector every day [40]. Naturally, this attraction has gripped social psychology researchers as well as application developers and economists. Many academic studies are conducted to determine the motivation behind the high demand for mobile games [41, 42, 43] . However, the literature is lacking to keep up with the pace of this constantly updated industry and to define the audiences and motivations addressed by these updates.

This study was designed to contribute to the results in the field. When examined from a Gestalt perspective, the results support the literature on generally accepted principles. When the study is evaluated specifically, it comes to the fore with its contributions to 'motivation' theories, which are considered to be an important deficiency in studies in the field of digital world [44]. The fact that some contradictory results are achieved in studies conducted in the academic field is natural features of factors such as time spent only in the digital world, the number of participants, and evaluations made through a single application. In this study, researchers aimed to achieve consistent results by focusing on 'participant motivations'.

The maturation of the digital world within the framework of the army, academia, engineering and industry can be examined against women in terms of gender. As a reflection of this male-dominated framework, the researchers did not find any significance for 'loneliness' by gender in this study (Table 3). However, similar studies show that neurotic women are more lonely and tend to use social technologies [45]. The fact that no significance could be found in loneliness by gender in this study supported the general studies and revealed the necessity of special studies. It is predicted that longitudinal quantitative studies and motivation-based qualitative studies can explain the relationships between gender and loneliness.

When the sub-dimensions of MGMS were compared according to gender, significant results were obtained in favor of men in all sub-dimensions. Each society creates its own concept of 'masculinity' within the framework of the cultural understanding it is in and accordingly turns it into a concept. The situation in women, unlike men, is explained by the idea of social belonging and the definition of women

in certain areas [46]. In traditional societies, this area has been defined as 'household'. For this reason, it was considered acceptable that the motivation of women towards the digital world and accordingly mobile games is not significant.

While defining the responsibilities of the individual developmentally, Havighurst explained that they are shaped around three main principles. These are maturation, culture and experience. In traditional societies, it is accepted that men can fulfill their developmental tasks more easily and in a timely manner than women [47]. In this study, when the sub-dimension 'developmental tasks' is examined, it can be said that men make a more intense effort to satisfy both social and personal characteristics through mobile games.

The stress response of people is behaviorally and physiologically explained by the 'fight or flight response' [48]. In all cultures, men are expected to show a fight response under pressure. In women, these stress reactions are generally defined as 'tend and be friend' [49]. However, it is known that the changing living conditions and the increasing pressure in working life show itself with the flight response in men. Similar to the results of Caplan, the researchers concluded that the area where the flight response can be expressed most easily is mobile games in favor of men, and that the sense of competition can be eliminated through mobile games.

Leisure activities often provide rewarding flow experiences. The flow model draws attention to the balance between perception of one's skills and the perception of difficulty of the activity [50]. Studies show that individuals spend more time in areas where they are rewarded. Specifically, it is known that men tend to have more experiences related to the excitement and impulse control. In this respect, men are associated with more digital skills and more digital game activities than women [51]. The researchers reached similar results in this study and obtained results in favor of men in the sub-dimension 'mobile flow'.

The number of studies examining the relationship between loneliness and income status is very few. It is thought that the reason for the limited number of studies is that young adulthood period is developmentally considered as the period when regular income begins to be fully provided [52]. However, factors such as 'income, marital status, health' are globally considered as predictors of loneliness. Most of the studies have concluded that as income increases, loneliness decreases [31, 53, 54]. It is ironic that while high income and well-being are considered as a barrier to loneliness, three of the G5 countries (USA, Germany, UK, Japan and France) have established 'loneliness ministries' [55]. Hawkley et al. [56] found no evidence between predictors of overall loneliness and young adult

individuals. At this stage, it is difficult to say that income level is a predictor of loneliness in any case. In this study, the researchers concluded that young adults with incomes above country standards are more lonely (Table 4). Determining the relationship between income level and young adult individuals emphasizes the necessity of longitudinal studies [57]. The researchers advocate examining factors such as past experiences, culture levels, habits, etc. as predictors of the relationship between loneliness and income level.

It is thought that there is no significant difference between the sub-dimensions of MGMS and income level due to the facilitating effects of factors such as the prevalence of mobile devices and ease of access on mobile gaming motivation [58, 59]. Studies conducted on children aged 3-6 reveal the cognitive and physical benefits of designing digital games today [60]. Laying the foundations of different learning methods and recreational habits for young adults continues to develop with the disappearance of income-related disadvantages.

The high mobile gaming motivations of individuals who have 10 hours or more of free time per week in MGMS total scores indicates the changes in their leisure time habits (Table 5). In accordance with the fact that people exist with social interaction, it can be said that social exchange has experienced a spatial change with digitalization [61]. These features, which have been transferred to the digital world, have allowed new dimensions to emerge in making use of leisure time [62, 63, 64]. It is not possible for individuals who have 10 hours or more of free time per week to ignore this new world. As the researchers expected, the results showed themselves with a total mobile gaming motivation. High significance in the "escape and competition" sub-dimension should be accepted as a natural product of today's living conditions [65]. Studies on coping with stress show that the easiest escape area is always preferred individually [66]. On the other hand, digital areas are accepted as the areas where competition can be most easily satisfied in our age. Practitioners try to benefit from the positive effects of this impulsive behavior, especially with violent and competitive mobile games [67]. It is also supported by research results that highly satisfied competitive behavior increases commitment to games and creates a motivation [68]. It is suggested by researchers to examine the relationship between the perception of boredom and the increase in the sub-dimension "escape and competition" as the leisure time increases [69]. It is generally considered important to deal with the main source of motivation leading to behavior from more than one point of view.

The fact that mobile gaming motivation of individuals who play mobile games for 4 hours or more weekly in all sub-dimensions of MGMS is high

is similar to studies on addiction at certain levels (Table 6). However, studies on addiction associate the time devoted to mobile games with a minimum of 6 hours per day and a high prevalence of deprivation experience [3, 70].When the results are examined as a whole, it would be correct to explain this significance with high motivation, not addiction. The high motivation of university students who play mobile games seems to be compatible with the expectations of the researchers. It is accepted that factors such as the widespread use of mobile devices, consumption habits and social relationship levels, especially observed on generation Z, affect the motivations for mobile games [12, 13, 71].

Researchers found a low level of positive correlation with loneliness in total and all sub-dimensions of MGMS (Table 7). It can be said that lonely individuals try to create an expression area for themselves through games. Until recently, digital game players were considered to be shy, asocial or problematic [72]. However, recent studies show the positive effects of social internet and connected products on issues such as preventing anti-social behaviors and loneliness, improving social relations, and education [73, 74]. In the light of these studies, 'digital loneliness' should be handled with a different approach. The universal classification criteria of loneliness cannot give decisive results in all circumstances. The association of the characterizations of asocial and anti-social behaviors with loneliness shows too specific characteristics to be examined under a single dimension.

Conclusions

As a result, the researchers conducted their studies on the concept of 'motivation', which is considered to be a major deficiency in studies in the field of social internet in general and mobile games in particular, and 'loneliness', which is accepted as a universal problem, and reached generalizable results on generation Z undergraduate students. The researchers presented a different perspective to the literature by examining the relationship between 'loneliness' and the structure they created through the sub-dimensions of MGMS 'developmental tasks', 'escape and competition' and 'mobile flow'.

Based on these research results, the authors advocate including digital technologies in predictors of loneliness. The relationship between loneliness and mobile applications and games, which are used by millions of undergraduate students as communication, learning and recreation tools, should not be ignored. It is recommended to develop mobile game and application-supported programs in order to cope with the feeling of loneliness experienced more intensely in later ages.

Conflict of interest

The authors declare no conflict of interest.

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