

ECONOMIC ANALYSIS OF GENDER DIFFERENCES IN ENGAGEMENT AND COMPETITIVENESS WITHIN ESPORTS

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Abstract: This research aimed to analyze gender differences in the video game industry, focusing on usage patterns, mobile devices, and competitive approaches to gaming. The study employed a quantitative methodology, using a questionnaire to collect data from over seven hundred respondents in the Republic of Croatia. The analysis, conducted using IBM SPSS v.26, highlighted significant trends within the video game industry, showing that many respondents reduced their engagement with video games as they transitioned into adulthood. Men were more likely to use consoles and computer platforms in their youth, while women preferred mobile devices. The findings further reveal that men remain more involved in esports and competitive gaming, a growing segment of the video game industry, where they follow competitions and engage in competitive play more frequently than women. The study concludes that there are significant differences in how men and women interact with the video game industry, with men showing a stronger preference for competitive gaming on traditional platforms, while women favor mobile gaming and are less engaged in competitive video gameplay.

Keywords: video game industry, gender differences, esports

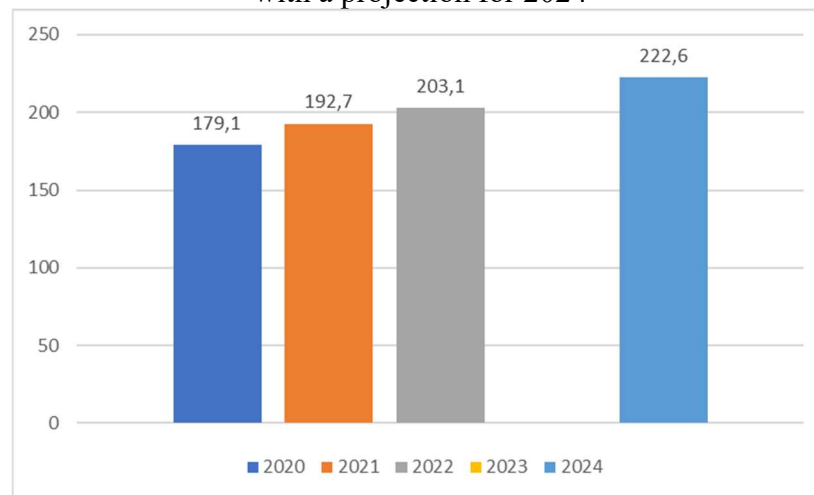
Introduction

Video games started to appear as early as the 50s and 60s of the 20th century, and the concept of playing video games is almost as old as the computer itself. It should be noted that back then, video games were more about studying computers and their capabilities than about pure entertainment. The cultural and economic impact of the video game industry is impossible to ignore in this day and age. A video game is any interactive game displayed using computer circuits, i.e., software on computers, consoles, arcade machines, or mobile phones. Nowadays, video games can be played independently and with other people through the same or different devices [1]. The video game industry has come a long way from the days of arcade machines to today, so numerous organizations responsible for developing and publishing video games have developed over the years. The two most important terms in that industry are "game developers" (engineers of video game development) and video game publishers ("game publishers") [2]. The cultural imprint that video games have left over the years has become increasingly visible, and worldwide sales of computer and video games in 2002 exceeded 30 billion US dollars. About a decade later, that

figure has almost doubled. Box office revenues in America in 2008 were approximately US\$9.5 billion [1].

COVID-19 and the entire coronavirus crisis did not have a significant negative impact on this industry. Moreover, the video game industry has experienced significant growth over the past two years. Given that technology had to advance rapidly, companies adapted and took advantage of the opportunity presented by the global crisis. During the pandemic, people looked for different ways of entertainment, and video games became the primary source of entertainment. This is precisely why video game companies have made exceptional profits [3]. It is estimated that the video game industry will continue to grow in the coming years and that the revenues in 2024 will amount to about 222.6 billion US dollars, which is shown in Figure 1 with a compound annual growth rate (CAGR - Compound Annual Growth Rate) of 5.6 %.

Figure 1: Video Game Industry Revenue (Billion USD) 2020-2022 with a projection for 2024



Source: Adapted from (Wijman, 2022) [4]

The purpose of this paper is to analyze the differences in the use of video games between the sexes, with an emphasis on the patterns of video game use in women and men, and to investigate how these patterns change over time. The paper also investigates the impact of the general use of mobile devices on the use of video games and examines gender differences in the competitive approach to video games. Objectives: to examine the frequency of video game use among women and men, with a focus on differences in time spent playing video games; analyze the daily patterns of mobile device usage among men and women and their impact on the use of video games; to investigate changes in engagement in sports and video games in both sexes over time and to determine differences in the competitive approach to video games between men and women and how this affects the frequency and manner of playing.

1. The Development of Video Games through History

The video game industry has advanced compared to the software and hardware industries. It is important to note that the video game industry cannot be classified as a software industry. At the beginning of the video game industry, they were developed as software. However, they have progressed, and we can no longer consider them exclusively part of the software industry [5]. Very soon after the appearance of the first video games in the 1950s, the engineer and mathematician Claude Shannon proposed in 1950 the idea that a computer could be programmed to play chess. He thus raised the question of whether computers can think, which prompted years of further research in the field of artificial intelligence [1].

After games began to be developed on computers and arcade machines, it was time to make it possible to play video games on televisions. The Magnavox company soon acquired the rights to create a game console, which in 1972 led to the creation of the first game console called the Magnavox Odyssey [1]. As early as the 1970s, video games could be designed and played on a new computer with an operating system using programming languages such as BASIC. In the late 1970s, computers released by IBM Personal Computer and Apple Computer appeared, which had a variety of input devices, colour, and flexible data storage capacity, while computers such as the Commodore 64 still used video game cartridges [1]. After the collapse of the game console industry in 1983, the future could have looked more optimistic. However, the success of the Nintendo console in Japan, changing the console's name and design to the Nintendo Entertainment System (NES) ensured success in the US. According to data from Nintendo, the NES has sold more than 60 million copies worldwide [1]. During the 1990s, game console technology was constantly advancing and improving. However, Sony's PlayStation 2, Microsoft's Xbox, and Nintendo's GameCube represented a significant technological leap in the 2000s. These consoles dominated the market thanks to technology that enabled the display of 3D graphics and connection to the Internet, allowing players to play video games with other players worldwide [1].

In 1989, Nintendo further expanded its success with the Game Boy portable console, which had its display. The Game Boy line proved highly successful, selling more than 100 million copies by 2007. Soon after, mobile devices began to be used as platforms for video games, with games such as "Snake" on Nokia phones in 1997. One of the first successful mobile games was "Angry Birds," released in 2009 on various models of mobile devices [1]. With the development of the Internet and technology during the 1990s and 2000s, new genres of video games emerged. For example, FPSs (first-person shooters) have become popular. Also, multiplayer video games, such as "World of Warcraft," have allowed players to create their characters and explore virtual worlds together. With the advent of social networks, online video game users have increased significantly [1]. In the last decade, mobile platform development has led to a new expansion of the video game industry. Games like "Angry Birds" and "Candy Crush" are opening the door to a new market of casual gamers, while consoles like the PlayStation 5 and Xbox Series X are raising the bar for graphics quality, performance, and virtual reality technology. Today, video games are a cultural phenomenon used for entertainment, education, therapy, and social interaction. The video game industry is continuously evolving, following technological innovations such as artificial intelligence, virtual reality, and blockchain technologies, ensuring that video games remain one of the most essential forms of media entertainment in the 21st century.

2. Users of Video Games

The demographics of video game users have undergone a significant transformation, now encompassing a diverse population across all age, gender, and socioeconomic groups. This evolution, from the early days of video games in the 1970s to the present digital platforms, has greatly expanded the user base. The shift in demographics is a result of changes in game design, the proliferation of platforms, and the increasing cultural significance of video games in today's society.

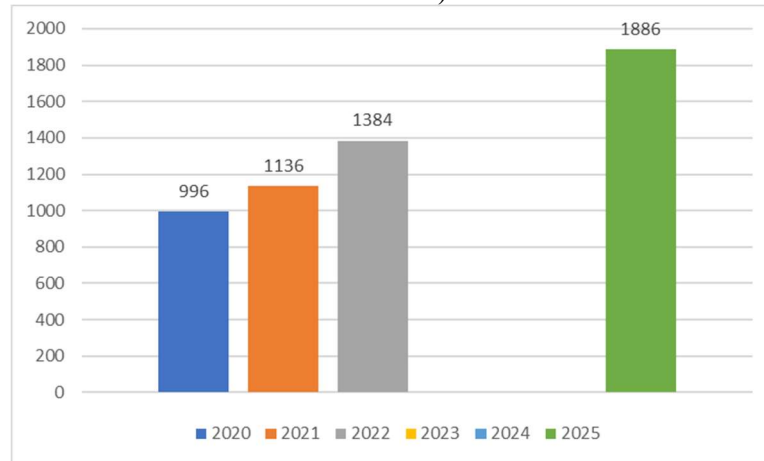
Although video games in their early days were primarily aimed at younger generations, the demographic profile of users has broadened over time. According to a survey by the Entertainment Software Association [6], the average age of video game players in the United States is 33, significantly higher than generally assumed. This figure shows that gamers who played video games as children are now continuing to play into adulthood, while younger generations are constantly joining. Most of the players in the USA are young men. However, a 2017 survey shows that roughly four in ten women and roughly a quarter of Americans age 65 and older report playing video games occasion-ally. Sixty percent of Americans aged 18 to 29 and 53% of respondents aged 30 to 49 say they play video games occasionally or more often than older age groups. In a survey conducted by the Pew Research Center, video games that can be played on television, consoles, computers, and portable devices were included [7]. The video game industry used to be perceived as a market dominated by young men, but over the years, especially in the last decade, that stereotype has broken down. Namely, the number of women as players and employees in the video game industry is increasing, and the trends regarding the age of players are also changing, where older players are also encountered. Also, the video game industry is expanding geographically in countries where it was not previously present, thanks to the advancement of technology [8]. Another industry strength is the increased number of employed women and people from different nations and cultures compared to last year. The result is the increasing promotion of diversity and culture in recent video games, which creates greater tolerance for diversity within and outside the industry [8].

In 2020, women made up nearly 41% of all gamers in the US; in Asia, the percentage was between 40 and 45%. During the last decade, there has been an increase in the number of female video game players, so numerous studies are trying to understand the reasons why women play video games [8]. Despite the almost equal number of female and male gamers today, there is a difference in the motivations for playing video games between men and women. In one study conducted in 30 different markets, it turned out that the primary motive for playing video games among women is to pass the time, and they play mobile video games most often. Also, this is the most significant difference between male and female players, as 36% of women play for the stated motive, while for men, this share is only 19%, which can be seen in Figure 6 [9].

There is a noticeable difference in habits between the sexes. 70% of men under 30 say they occasionally or often play video games, compared to 49% of women in the same age group. However, in older age groups, there are more similarities; 27% of men over 50 occasionally play video games, while among women of the same age group, this per-centage is 30% (Brown, 2017). Puzzle video games are more popular with women than men, with as many as 72% of female video game players reporting playing this type of game, compared to 52% of men. Puzzle video games

are also more prevalent among people over 65, and college-educated people are expected to play them more often than people without that degree [7].

Figure 2: Number of video game players worldwide (2020-2022) with projections to 2025 (in millions).



Source: Adapted from (Newzoo, 2023, p. 18)

Video game users represent an increasingly diverse group, spanning different ages, genders, and socioeconomic groups. With the evolution of video games and technology development, the gaming market is becoming more inclusive, allowing access to various demographic groups. Today, video games play a crucial role in modern culture, crossing the boundaries of entertainment and becoming a tool for learning, social interaction, and personal development.

3. Research Results

An empirical study was conducted to determine the purpose and goal of this paper. Research hypotheses were set, and certain conclusions were drawn based on them.

3.1. Research hypotheses

For the research, a question was asked: Are there differences between men and women in their attitudes and perceptions about video games? Based on the research question, the null hypothesis was set:

H0: There is no difference in the perception of video games between men and women

Based on the defined null hypothesis, research hypotheses were created that will help in rejecting or accepting the null hypothesis:

H1 Women use mobile devices and video games less than men

H2: Men are more inclined to use video games more competitively

3.2. Methodology

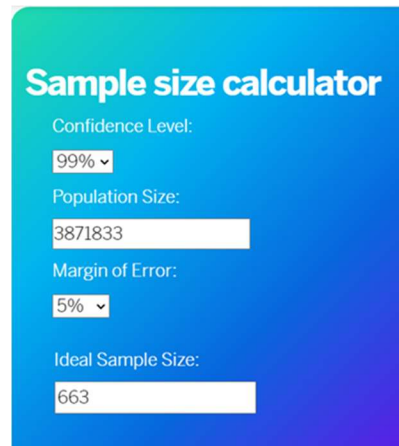
Empirical research was conducted through a questionnaire sent via social networks and various groups on the same networks in partially controlled conditions, where the emphasis was on obtaining an adequate number of responses so that the research could be representative. The main advantages of this method are the collection of data and information about experiences and attitudes, the examination of phenomena from the past and present, as well as plans and visions of the future, as well as the more accessible collection of more data and information in a shorter period [10]. The collected data were processed on a personal computer using the statistical analysis program IBM SPSS v.26. Various approaches were used to analyze the collected data, shared in applying the statistical scientific method. They include:

- descriptive statistical analysis of collected data showing measures of central tendency, measures of variability, and graphical and tabular representations of fundamental statistical values,
- inferential statistics refers to verifying established hypotheses with the help of statistical tests, coefficients, and their significance.

3.3. Research group (sample)

The research group (sample) consists of 747 respondents from the Republic of Croatia, on whom empirical research was conducted as part of more comprehensive research, and their views on the mentioned topics were examined. Part of the mentioned research and the obtained results were used in the writing of this paper. The research was conducted from the middle of May 2024 to the beginning of June 2024. To assess the reliability of the sample, stability methods were used, among which Cronbach's alpha coefficient is the most famous [11]. According to the central limit theorem, regardless of the form of the distribution of the population from which it originates - each sample distribution will be approximately normally distributed, provided that the sample size is large enough [11]. According to [11], it is recommended to use the G*power program, which performs precise statistical power analysis for the most commonly used statistical group tests. According to the last population census in the Republic of Croatia, 3,871,833 inhabitants [12] represent the population. By conducting the test available on the website [13], it was determined that the ideal sample for the 99% confidence level and the specified population with a standard error of 5% is 663 respondents. Given that the sample in this research is significantly more extensive and amounts to 747 respondents, it can be concluded that the presented results can represent the objective results of the population. Additional tests were carried out for individual research results in the following section.

Figure 3: Calculation of the ideal sample



Sample size calculator

Confidence Level:
99% ▼

Population Size:
3871833

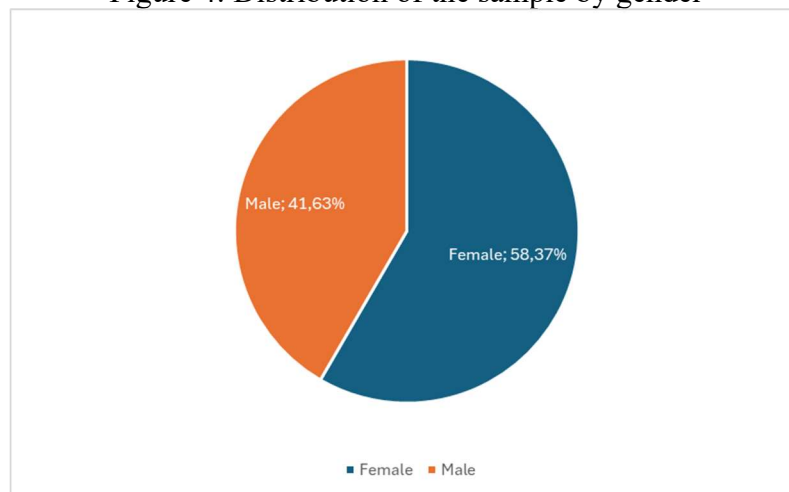
Margin of Error:
5% ▼

Ideal Sample Size:
663

Source: Calculation taken from (Qualtrics, 2024) [13]

The distribution of the sample of 747 respondents according to gender is shown in the following figure.

Figure 4: Distribution of the sample by gender



Source: Original author's (n=747)

The results show that more women than men participated in the research. Regardless of this difference, it is possible to carry out representative research if certain conditions are met. Given that the specified variable represents an independent variable in the re-search, it is important to determine the required minimum sample size for the two groups of the independent variable when conducting further testing.

With the help of the program G*Power [14] for a significance level of 5% and a statistical power of 0.95, a minimum sample size of 346 subjects is required, i.e., at least 173 subjects per group of the observed independent variable with a sample size of 0.25 (medium size). Seven hundred forty-seven respondents participated in the conducted re-search. The smallest number of one group is

311, meaning that the researchers met the basic assumptions necessary for conducting parametric tests with the research design and sample design.

3.4. Research results

At the very beginning, it is interesting to show the respondents' answers about how much time they use mobile phones and their gender.

Table 1. Approximate amount of time you spend per day on your mobile phone

			1 hour	2 hours	3 hours	4 hours	5 and more hours	Total
Sex	Male	Count	41	96	75	52	47	311
		%	13,20%	30,90%	24,10%	16,70%	15,10%	100,00%
	Female	Count	48	108	103	86	91	436
		%	11,00%	24,80%	23,60%	19,70%	20,90%	100,00%
Total		Count	89	204	178	138	138	747
		%	11,90%	27,30%	23,80%	18,50%	18,50%	100,00%

Source: Original author's (n=747)

The research results show that women use mobile phones on average more time than men, and the most noticeable difference is in the category of those who use mobile phones for five or more hours a day. The following tables show data on whether men and women used video games in their youth and whether they use them now. Likewise, the tables show data on which platforms the respondents used video games in their youth and on which they use them today.

Table 2. Use of video games in youth by gender

			No	Yes	Total
Sex	Male	Count	38	273	311
		%	12,20%	87,80%	100,00%
	Female	Count	125	311	436
		%	28,70%	71,30%	100,00%
Total		Count	163	584	747
		%	21,80%	78,20%	100,00%

Source: Original author's (n=747)

Table 3. Platforms that respondents used to play video games in their youth

	Mobile Phone		Tablet		Computer		Console	
	Yes	No	Yes	No	Yes	No	Yes	No
Male	22,5%	77,5%	4,5%	95,5%	63,3%	36,7%	41,8%	58,2%
Female	34,4%	65,6%	8,0%	92,0%	42,7%	57,3%	20,0%	80,0%

Source: Original author's (n=747)

Table 4. Current use of video games by gender

			No	Yes	Total
Sex	Male	Count	93	218	311
		%	29,90%	70,10%	100,00%
	Female	Count	202	234	436
		%	46,30%	53,70%	100,00%
Total		Count	295	452	747
		%	39,50%	60,50%	100,00%

Source: Original author's (n=747)

Table 5. Platforms currently used by respondents to play video games

	Mobile Phone		Tablet		Computer		Console	
	Yes	No	Yes	No	Yes	No	Yes	No
Male	37,0%	63,0%	3,9%	96,1%	30,2%	69,8%	26,0%	74,0%
Female	48,6%	51,4%	3,4%	96,6%	10,6%	89,4%	6,2%	93,8%

Source: Original author's (n=747)

In their youth, 21.8% of respondents never played video games, while now, the percentage of those who do not play has increased to 39.5%. On the other hand, almost four-fifths of the respondents played video games to some extent during their youth, while today, approximately two-thirds continue to play them. Data analysis shows that men played video games 16% more than women in their youth, with men using computers and consoles more often and women using mobile phones and tablets. Today, men use tablets, computers, and consoles more often, while women prefer mobile phones. Based on this data, many of the respondents still play video games.

Given the possible differences in men's and women's perceptions of video games, respondents were asked whether they played sports in their youth and whether they currently play sports. The goal was to discover a possible correlation between sports and video games.

Table 6. How often you played sports in your youth

			Never	Almost never	Sometimes	Often	Very often	Total
Sex	Male	Count	10	8	56	96	141	311
		%	3,20%	2,60%	18,00%	30,90%	45,30%	100,00%
	Female	Count	32	48	117	134	105	436
		%	7,30%	11,00%	26,80%	30,70%	24,10%	100,00%
Total		Count	42	56	173	230	246	747
		%	5,60%	7,50%	23,20%	30,80%	32,90%	100,00%

Source: Original author's (n=747)

Table 7: How often do you play sports now?

			Never	Almost never	Sometimes	Often	Very often	Total
Sex	Male	Count	28	38	96	86	63	311
		%	9,00%	12,20%	30,90%	27,70%	20,30%	100,00%
	Female	Count	60	88	141	104	43	436
		%	13,80%	20,20%	32,30%	23,90%	9,90%	100,00%
Total		Count	88	126	237	190	106	747
		%	11,80%	16,90%	31,70%	25,40%	14,20%	100,00%

Source: Original author's (n=747)

Table 8: How often you played video games in your youth

			Never	Almost never	Sometimes	Often	Very often	Total
Sex	Male	Count	34	38	78	82	79	311
		%	10,90%	12,20%	25,10%	26,40%	25,40%	100,00%
	Female	Count	122	114	130	51	19	436
		%	28,00%	26,10%	29,80%	11,70%	4,40%	100,00%
Total		Count	156	152	208	133	98	747
		%	20,90%	20,30%	27,80%	17,80%	13,10%	100,00%

Source: Original author's (n=747)

Table 9: How often do you play video games now?

			Never	Almost never	Sometimes	Often	Very often	Total
Sex	Male	Count	85	73	76	46	31	311
		%	27,30%	23,50%	24,40%	14,80%	10,00%	100,00%
	Female	Count	199	122	74	30	11	436
		%	45,60%	28,00%	17,00%	6,90%	2,50%	100,00%
Total		Count	284	195	150	76	42	747
		%	38,00%	26,10%	20,10%	10,20%	5,60%	100,00%

Source: Original author's (n=747)

The research results show that in their youth, more than 75% of men and 58% of women were intensively involved in sports. Over time, this percentage decreased, and now, 48% of men and 34% of women are intensively involved in sports. In order to determine the (non)existence of differences between men, it is necessary to perform an appropriate statistical test. The t-test of independent samples was used to test the assumption of a statistically significant difference between two arithmetic means of independent samples, where the independent variable is gender, which is a nominal variable, and it is a dichotomous variable, which is ideal for such a test. In this case, one independent variable (gender) and several dependent variables are used on an ordinal measurement scale. The initial hypothesis of this test is that there is no statistically significant difference between the observed (tested) arithmetic means of the independent variable gender.

Table 10: Independent Samples T-Test

Group Statistics					
	Sex	N	Mean	Std. Deviation	Std. Error Mean
1. Sport in youth	Male	311	4,13	1,007	0,057
	Female	436	3,53	1,181	0,057
2. Sports right now	Male	311	3,38	1,196	0,068
	Female	436	2,96	1,178	0,056
3. Playing video games at a young age	Male	311	3,43	1,288	0,073
	Female	436	2,38	1,138	0,054
4. Playing video games instantly	Male	311	2,57	1,301	0,074
	Female	436	1,93	1,061	0,051

Independent Samples Test										
		Levene's Test for Equality of		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the	
									Lower	Upper
1. Sport in youth	Equal variances assumed	18,705	0	7,191	745	0	0,593	0,083	0,431	0,755
	Equal variances not assumed			7,384	721,715	0	0,593	0,08	0,436	0,751
2. Sports right now	Equal variances assumed	2,03	0,155	4,782	745	0	0,421	0,088	0,248	0,593
	Equal variances not assumed			4,77	661,642	0	0,421	0,088	0,248	0,594
3. Playing video games at a young age	Equal variances assumed	7,082	0,008	11,74	745	0	1,048	0,089	0,873	1,223
	Equal variances not assumed			11,5	615,264	0	1,048	0,091	0,869	1,227
4. Playing video games instantly	Equal variances assumed	33,09	0	7,383	745	0	0,639	0,087	0,469	0,809
	Equal variances not assumed			7,138	580,863	0	0,639	0,09	0,463	0,815

Source: Created by the author based on research and using the SPSS program

In order to determine whether all five assumptions are met for conducting a t-test, the first four assumptions related to variables, sample, independence of observations, and nominality were confirmed at the beginning of the research. The fifth assumption, which refers to the homogeneity of the variances, which in this case was confirmed only in the second test, refers to the question about the current practice of sports; therefore, for this case, the data from the first row of Levene's test (marked by colour in the table) are read, and in other cases data from the second row of Levene's test (indicated by colour in the table). Based on the results of the t-test of independent samples, it can be concluded that men and women differ statistically significantly in:

- playing sports in youth ($t=-2.610$, $df=745$, $p<0.05$). The determined difference in the arithmetic means of men (2.90 ± 1.266) and women (3.15 ± 1.305) is not considered accidental; it is statistically significant.
- practicing sports at the moment ($t=-2.610$, $df=745$, $p<0.05$). The determined difference in the arithmetic means of men (2.90 ± 1.266) and women (3.15 ± 1.305) is not considered accidental; it is statistically significant.
- playing video games in youth ($t=-2.610$, $df=745$, $p<0.05$). The determined difference in the arithmetic means of men (2.90 ± 1.266) and women (3.15 ± 1.305) is not considered accidental; it is statistically significant.
- playing video games in youth ($t=-2.610$, $df=745$, $p<0.05$). The established difference in the arithmetic means of men (2.90 ± 1.266) and women (3.15 ± 1.305) is not considered accidental; that is, it is statistically significant.

With this, the initial (null hypothesis) hypothesis that there are no statistical differences between the observed groups can be rejected and the alternative hypothesis that there are still statistically significant differences between the observed groups can be accepted. These findings provide valuable insights into the relationship between gender and sports and video game preferences, enhancing our understanding of these dynamics. In the further process, it is necessary to determine whether and what kind of connections exist between playing sports and video games in youth and now, that is, whether there are mutual correlations among the observed respondents and what their relationship is. This next step in the research is crucial and will keep the audience engaged and interested in the ongoing findings. The results of the research are presented in the following table.

Table 11: Correlations between playing sports and playing video games

		Sport in youth	Sports right now	Playing video games at a young age	Playing video games instantly
Sport in youth	Pearson Correlation	1	,423**	,212**	,089*
	Sig. (2-tailed)		0	0	0,015
	N	747	747	747	747
Sports right now	Pearson Correlation	,423**	1	,140**	,096**
	Sig. (2-tailed)	0		0	0,009
	N	747	747	747	747
Playing video games at a young age	Pearson Correlation	,212**	,140**	1	,557**
	Sig. (2-tailed)	0	0		0
	N	747	747	747	747
Playing video games instantly	Pearson Correlation	,089*	,096**	,557**	1
	Sig. (2-tailed)	0,015	0,009	0	
	N	747	747	747	747
**. Correlation is significant at the 0.01 level (2-tailed).					
*. Correlation is significant at the 0.05 level (2-tailed).					

Source: Original author's (n=747)

The research results show statistically significant correlations in all observed cases, with the fact that they differ in intensity from weak to moderate to intense, at a significance level of 99%. There is a positive, statistically significant, and strong correlation ($r=0.557$) between playing video games in their youth and now, which means that respondents who often and very often played video games in their youth still do so now. In addition, research shows a weak to moderate correlation between gender and playing sports (in youth and now) and video games (in youth and now).

Competitive video gaming is on the rise, a trend driven mainly by the development of Internet infrastructure. This technological advancement has enabled players to connect virtually over long distances. The following tables provide data on the respondents' familiarity with esports, their interest in following esports, and their participation in organized competitions.

Table 12: Have you heard of the term esports?

			No	Very little	Somewhat	Mostly	Yes	Total
Sex	Male	Count	50	18	26	25	192	311
		%	16,10%	5,80%	8,40%	8,00%	61,70%	100,00%
	Female	Count	209	72	45	23	87	436
		%	47,90%	16,50%	10,30%	5,30%	20,00%	100,00%
Total		Count	259	90	71	48	279	747
		%	34,70%	12,00%	9,50%	6,40%	37,30%	100,00%

Source: Original author's (n=747)

Table 13: Do you follow esports competitions?

			No	Very little	Somewhat	Mostly	Yes	Total
Sex	Male	Count	190	53	26	15	27	311
		%	61,10%	17,00%	8,40%	4,80%	8,70%	100,00%
	Female	Count	371	28	22	4	11	436
		%	85,10%	6,40%	5,00%	0,90%	2,50%	100,00%
Total		Count	561	81	48	19	38	747
		%	75,10%	10,80%	6,40%	2,50%	5,10%	100,00%

Source: Original author's (n=747)

Table 14: Have you ever competed in a video game in any organized competition?

			No	Very little	Somewhat	Mostly	Yes	Total
Sex	Male	Count	209	16	26	9	51	311
		%	67,20%	5,10%	8,40%	2,90%	16,40%	100,00%
	Female	Count	406	18	5	4	3	436
		%	93,10%	4,10%	1,10%	0,90%	0,70%	100,00%
Total		Count	615	34	31	13	54	747
		%	82,30%	4,60%	4,10%	1,70%	7,20%	100,00%

Source: Original author's (n=747)

Analysis of respondents' responses showed that 16% of men and 48% of women have not heard of esports, while 39% of men and 15% of women follow esports competitions. Also, 33% of men and only 7% of women have tried playing video games competitively. An additional study was conducted using the previously explained t-test of independent samples to confirm or reject the research hypothesis related to hypothesis H2 about how men are more inclined to use video games more competitively, which can be partially concluded from the previous tables.

Table 15: Independent Samples T-Test

Group Statistics					
	Sex	N	Mean	Std. Deviation	Std. Error Mean
1. Have you heard of the term esports?	Male	311	3,94	1,544	0,088
	Female	436	2,33	1,577	0,076
2. Do you watch esports competitions?	Male	311	1,83	1,283	0,073
	Female	436	1,29	0,817	0,039
3. Have you ever competed in any organized competition?	Male	311	1,96	1,534	0,087
	Female	436	1,12	0,516	0,025
4. Have you watched esports on TV?	Male	311	1,82	1,317	0,075
	Female	436	1,22	0,704	0,034

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
1. Have you heard of the term esports?	Equal variances assumed	0,992	0,32	13,855	745	0	1,608	0,116	1,38	1,836
	Equal variances not assumed			13,905	676,315	0	1,608	0,116	1,381	1,835
2. Do you watch esports competitions?	Equal variances assumed	96,045	0	6,967	745	0	0,536	0,077	0,385	0,687
	Equal variances not assumed			6,49	486,413	0	0,536	0,083	0,374	0,698
3. Have you ever competed in any organized competition?	Equal variances assumed	508,486	0	10,652	745	0	0,842	0,079	0,687	0,997
	Equal variances not assumed			9,313	360,372	0	0,842	0,09	0,664	1,02
4. Have you watched esports on TV?	Equal variances assumed	148,27	0	8,095	745	0	0,604	0,075	0,458	0,751
	Equal variances not assumed			7,374	436,358	0	0,604	0,082	0,443	0,765

Source: Original author's (n=747)

In order to determine whether all five assumptions are met for conducting a t-test, the first four assumptions related to variables, sample, independence of observations, and nominality were confirmed at the beginning of the research. The fifth assumption, which refers to the homogeneity of variances, which in this case was confirmed only in the first test, refers to the question about the concept of esports; therefore, for this case, the data from the first row of Levene's test (marked by colour in the table) are read, and in other cases, the data from the second row of Levene's test (indicated by colour in the table). Based on the t-test of independent samples, the key findings reveal significant gender differences in several aspects of esports awareness and participation. Men and women are statistically different in terms of:

- have they heard of the term esports ($t=-13.855$, $df=745$, $p<0.05$). The determined difference in the arithmetic means of men (3.94 ± 1.544) and women (2.33 ± 1.577) is not considered accidental; it is statistically significant.
- watching esports competitions ($t=-6.490$, $df=745$, $p<0.05$). The established difference in the arithmetic means of men (1.83 ± 1.284) and women (1.29 ± 0.817) is not considered accidental; it is statistically significant.
- competing in video games at an organized competition ($t=-9.313$, $df=745$, $p<0.05$). The determined difference in the arithmetic means of men (1.96 ± 1.534) and women (1.12 ± 0.516) is not considered accidental; it is statistically significant.
- watching esports on TV ($t=-7.347$, $df=745$, $p<0.05$). The established difference in the arithmetic means of men (1.82 ± 1.317) and women (1.22 ± 0.704) is not considered accidental; it is statistically significant.

With this, we can reject the initial (null hypothesis) hypothesis that there are no statistical differences between the observed groups (men and women) and accept the alter-native hypothesis that there are nevertheless statistically significant differences between the observed groups (men and women). Finally, considering that the research results show that video games are increasingly played on mobile phones and that more men than women participate in them, it was tempting to investigate how much time men and women spend on mobile phones per day. Therefore, an appropriate statistical t-test was performed.

Table 16: Independent Samples T-Test

Group Statistics					
	Sex	N	Mean	Std. Deviation	Std. Error Mean
How much time do you spend per day on your mobile phone?	Male	311	2,9	1,266	0,072
	Female	436	3,15	1,305	0,062

Independent Samples Test										
		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
How much time do you spend per day on your mobile phone?	Equal variances assumed	1,202	0,273	-2,61	745	0,009	-0,25	0,096	-0,437	-0,062
	Equal variances not assumed			-2,624	679,73	0,009	-0,25	0,095	-0,437	-0,063

Source: Original author's (n=747)

In order to determine whether all five assumptions are met for conducting a t-test. The first four assumptions related to variables, sample, independence of observations and nominality were confirmed at the beginning of the research. The fifth assumption related to homogeneity of variances is also confirmed in this case. Based on the results of the t-test of independent samples, it can be concluded that men and women differ statistically significantly in the time spent on mobile phones per day ($t=-2.610$, $df=745$, $p<0.05$). The established difference in the arithmetic means of men (2.90 ± 1.266) and women (3.15 ± 1.305) is not considered accidental, that is, it is statistically significant. Likewise, on the basis of the conducted research, it can be concluded that women spend more time on mobile phones compared to men, but they do not spend that time playing video games. This analysis opens additional questions related to the differences in the

purpose of using mobile phones between men and women, which can be the subject of some future re-research.

Based on the obtained results, the null hypothesis (H0) about the absence of differences in the perception of video games between men and women can be rejected. The first research hypothesis, which claims that women use mobile devices and video games less, is partially confirmed and partially rejected because the research showed that women spend more time per day using mobile phones, but at the same time spend less time playing video games. The second research hypothesis, that men are more inclined to play video games more competitively, was confirmed.

4. Discussion

This research revealed significant differences in the patterns of video game use between men and women, thus confirming previous research indicating national preferences in digital activities. Primarily, men preferred consoles and computer platforms at a younger age, while women used mobile devices more. These findings suggest that men traditionally use more technically advanced gaming platforms, which may be related to their interest in the competitive aspects of video games. In contrast, women use mobile devices more, which may be related to their preference for more accessible, casual forms of gaming. Furthermore, the research showed that although many respondents stopped playing video games in adulthood, males continued to play in greater numbers than females. This finding suggests that men have a longer-term interest in playing video games, especially in the context of competitive gaming. The results also confirm that men follow esports competitions more often and are more involved in competitive gaming. These differences may be due to cultural factors, as well as different motivations that drive men and women to participate in digital games. Understanding these cultural factors can provide a deeper insight into the societal influences on individual choices.

One of the critical contributions of this research is the identification of mobile devices as the dominant platform for women, while men still prefer consoles and computers. These results are consistent with trends showing that mobile games, often designed with a more straightforward interface and shorter play cycles, appeal to a broader population, including women. In contrast, competitive games on consoles and computers, which require more excellent technical skills and time, attract men. It was also observed that men participate more often in sports activities, which could be related to their interest in competitive games. This correlation between playing sports and video games suggests that a competitive spirit may be a common motive that drives men to engage in both forms of activity. This aspect could be interesting for further research, especially in the context of changes in gaming patterns over time.

This research confirms the existence of significant gender differences in video game use and platform preferences. It underscores the importance of further research to better understand the reasons behind these differences. Future research could focus on the analysis of motivational factors and social norms related to video game usage patterns in both genders, highlighting the urgency and importance of this topic in the field of gender studies and digital media.

5. Conclusion

This research points to significant differences in the way men and women use video games, confirming previous studies on gender preferences in digital activities. Younger men prefer consoles and computers, while women use mobile devices more, which indicates women's preference for more accessible and simpler games. Hypothesis H1, which stated that women use mobile devices and video games less than men, was partially confirmed – although women spend more time on mobile devices, they are less engaged in playing video games. Hypothesis H2, which suggests that men are more inclined to use video games more competitively, is also confirmed, as the results show that men follow esports competitions in greater numbers and participate more actively in competitive games. Considering these results, the null hypothesis (H0), which assumed that there are no differences in the perception and use of video games between men and women, can be rejected. Also, the research showed a connection between playing sports and a tendency towards competitive games in men, which further emphasizes the competitive spirit as a key factor. In conclusion, the research results point to the need for further study of motivational and cultural factors that shape these gender differences in video games.

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