Retrospective survey studies: Video Game Addiction

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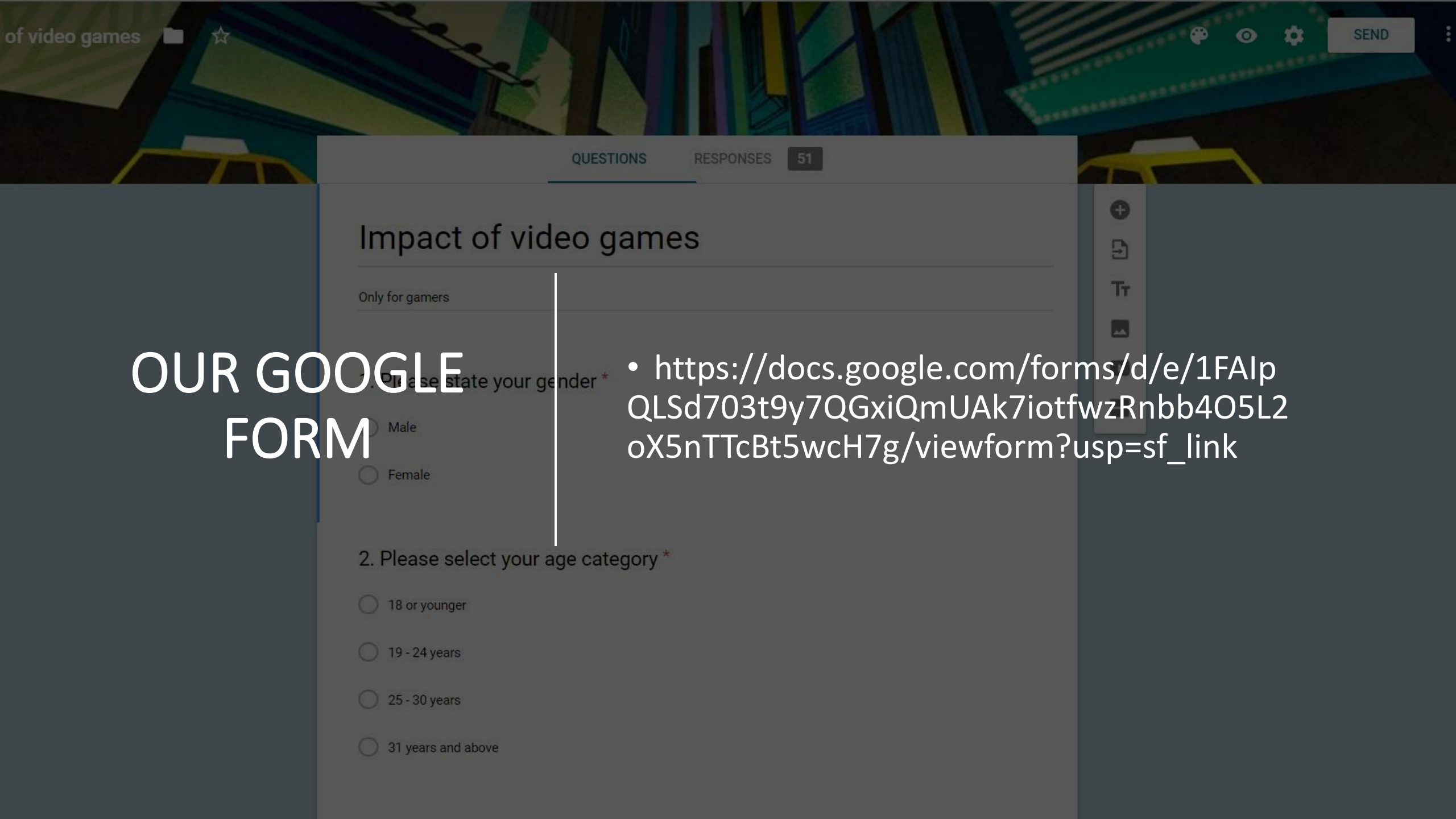
INTRODUCTION

- **Video game addiction** also known as **gaming disorder** or **internet gaming disorder** is generally defined as problematic, compulsive use of video and/or internet games, that results in significant impairment in an individual's function in various life domains over a prolonged period of time. This has been under considerable research, debate and discussion among experts in several disciplines, and have generated controversy from the medical, scientific and gaming communities. The disorder may present itself as compulsive gaming, social isolation, mood swings, diminished imagination, and hyperfocus on in-game achievements, to the exclusion of other events in life. Such disorders can be diagnosed when an individual engages in gaming activities at the cost of fulfilling daily responsibilities or pursuing other interests, and without regard for the negative consequences [3].

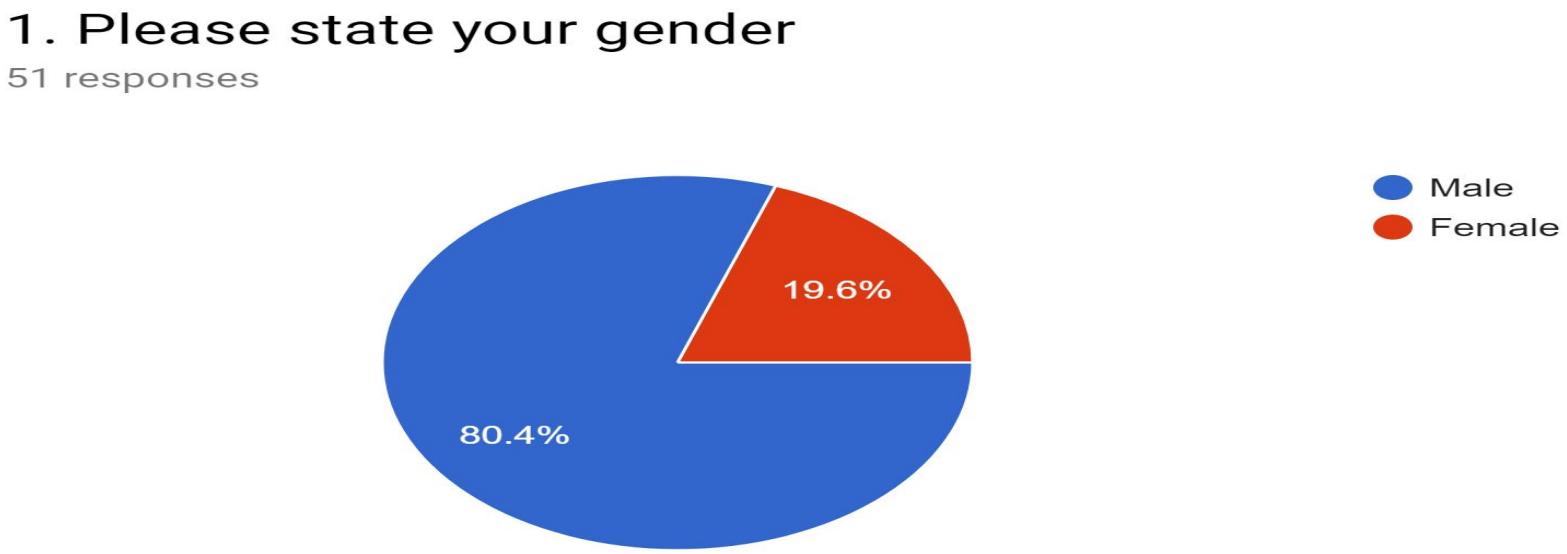
- The World Health Organization (WHO) included gaming disorder within the International Statistical Classification of Diseases (ICD-11). However, the American Psychiatric Association (APA), stated that there is insufficient evidence for the inclusion of internet gaming disorder in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) [1].
- Video game addiction is still disclosed as a disorder but has a large briefing window due to the influence of the addictive and immersive technology. We could say that video games are one of the fruits of technological development as in these games, stimulation and control of an entity other than themselves make it entertaining for the users [3].
- WHO has concluded that gaming is considered as a disorder as there are many reports of self-harm and even harm against others due to the level of addiction to video games. However, some parts of society do consider video games to contribute to the entertainment industry. Nowadays, E-sports which are electronic sports which are gaming events where the best video gamers gather to compete against each other, these events hold a large price pool and have a huge audience throughout the world.
- Some of the individuals pursue gaming as a career because they are very passionate towards it and not just as a hobby. This career choice is influencing a lot of gamers into taking up gaming as a career, which is setting a new trend in this generation.



OUR GOOGLE FORM

- https://docs.google.com/forms/d/e/1FAIpQLSd703t9y7QGxiQmUAk7iotfwzRnbb4O5L2oX5nTTcBt5wcH7g/viewform?usp=sf_link

STATISTICS FROM THE SURVEY

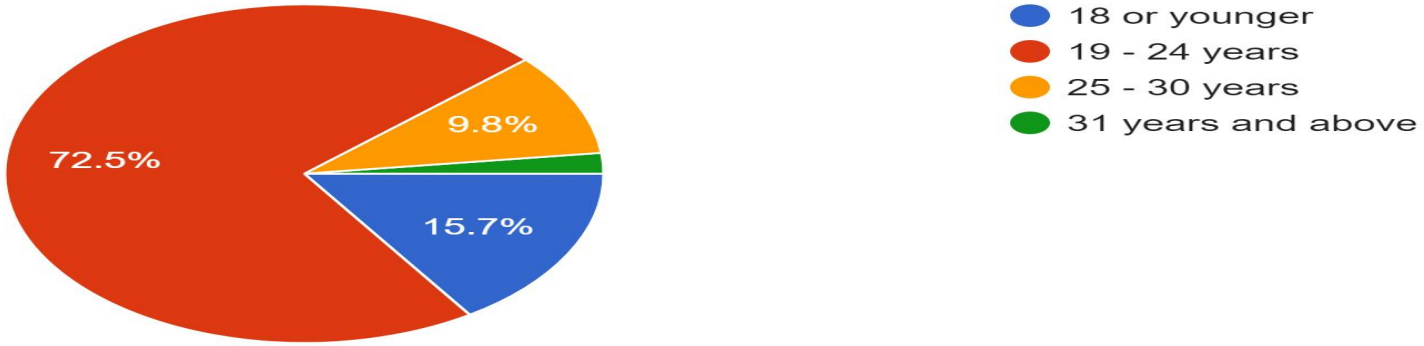


Frequency of M	41
Frequency of F	10
Proportion of M	0.803921569
Proportion of F	0.196078431

Conclusion: we know that 80.4% are male and the rest 19.6% are female. The proportion of the filled survey for male and female is 41:10. This concludes that from the survey, most gamers are male.

2. Please select your age category

51 responses



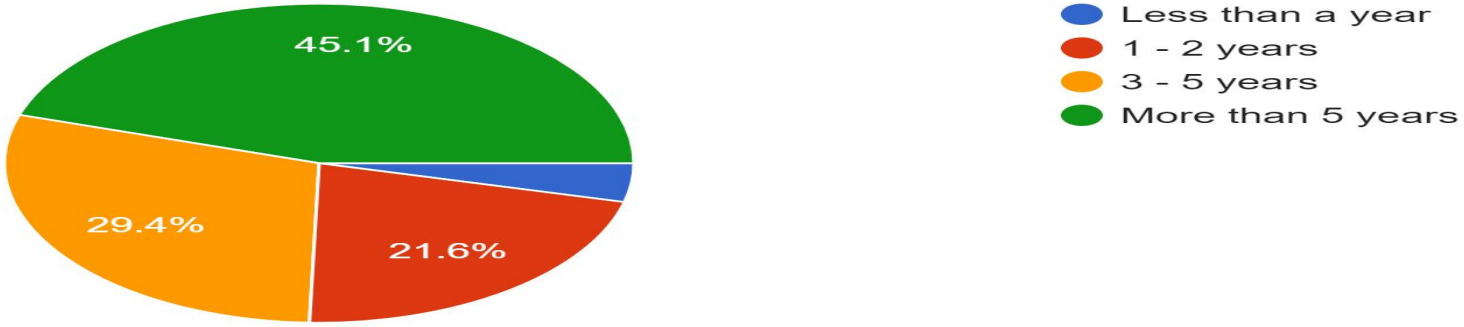
Age	Frequency (f)	Proportion	Midpoint (m) or x	f*m	x mean (m - mean age)	(x-mean)^2	f* (x-mean)^2
19 - 24 years	37	0.725490196	21.5	795.5	0.039216	0.001537895	0.056902102
25 - 30 years	5	0.098039216	27.5	137.5	6.039216	36.47212989	182.3606495
31 years and above (assuming 100 as max)	1	0.019607843	65.5	65.5	44.039216	1939.452546	1939.452546
18 or younger (assuming 6 as min)	8	0.156862745	12	96	-9.460784	89.50643389	716.0514712
Sum	51	1	126.5	1094.5	40.656864	1652.98059	2837.921569

Variance (s^2)	**56.75843137**
standard deviation (s)	**7.533819176**
Mean age= total f*m/ total f	**21.460784**

Conclusion: we know that 72.5% is between 19–24 years, 15.2% is 18 or younger, 9.8% is 25-30 years and 1.9% is 31 and above. The standard deviation is 7.53, and variance is 56.75. From this we can conclude that the deviation between mean age group to all age groups is 7.533.

3. How long have you been playing games for?

51 responses

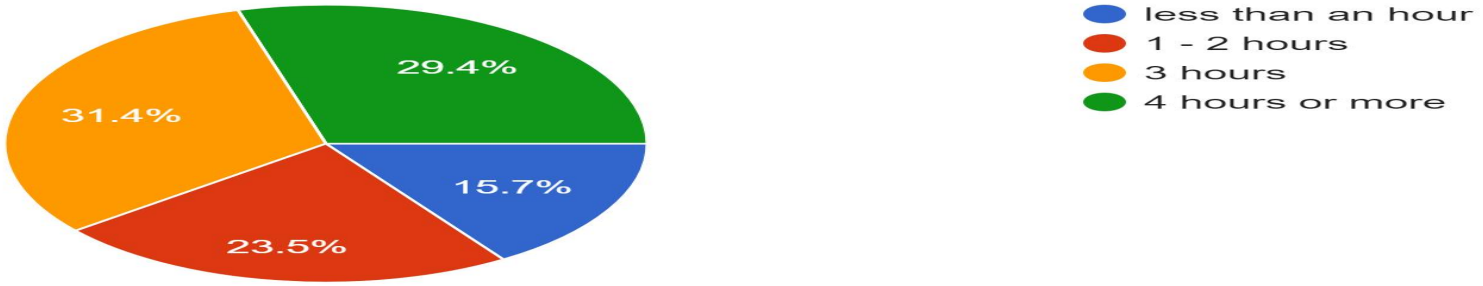


Duration have you have played video games?	Frequency (f)	Proportion	Midpoint (m) or x	f*m	x mean (m - mean age)	(x-mean)^2	f* (x-mean)^2
1 - 2 years	11	0.215686275	1.5	16.5	-14.90196275	222.0684937	2442.75343
More than 5 years (max =61 cause first game was created on 1958)	23	0.450980392	33	759	16.59803725	275.4948407	6336.381336
3 - 5 years	15	0.294117647	4	60	-12.40196275	153.8086799	2307.130199
Less than a year (min = 1.141 x 10^-4 or 0.0001)	2	0.039215686	0.50005	1.0001	-15.90191275	252.870829	505.7416579
Sum	51	1	39.00005	836.5001	-26.60780098	904.2428433	11592.00662
mean = sum f*m/ sum f	**16.40196275**						
Variance (s^2)	**231.8401325**						
standard deviation (s) [sqrt((f*(x-mean)^2)/(sum f - 1)]	**15.2262974**						

Conclusion: We know that 45.1% have been playing for more than 5 years, 29.4% have been playing for 3 – 4 years, and 21.6% have been playing for 1 – 2 years, and 3.92% have been playing for less than a year. The variance is 231.840 and the standard deviation is 15.22.

4. Roughly how many hours do you spend playing video games each day (e.g. gaming consoles, mobile phones, computers, etc.)?

51 responses

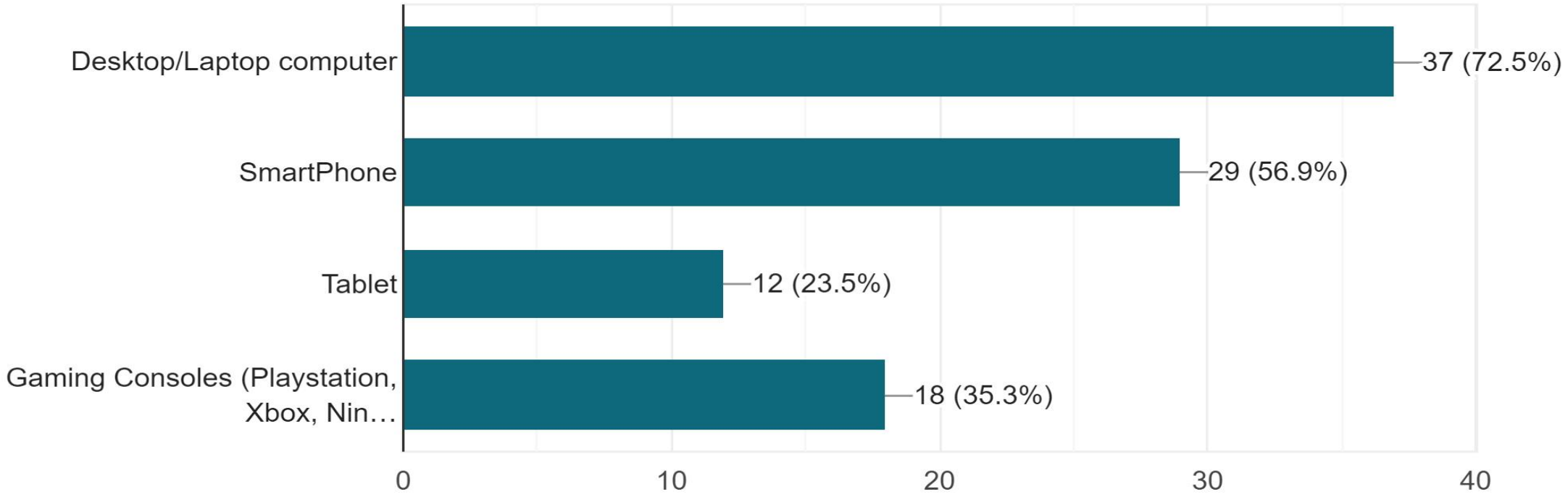


4. Roughly how many hours do you spend playing video games each day (e.g. gaming consoles, mobile phones, computers, etc.)?	Frequency (f)	Midpoint (m) or x	f*m	x mean (m - mean age)	(x-mean)^2	f* (x-mean)^2
4 hours or more (Max 24 hours)	15	14	210	8.50854902	72.39540642	1085.931096
1 - 2 hours	12	1.5	18	-3.99145098	15.93168093	191.1801711
3 hours	16	3	48	-2.49145098	6.207327988	99.3172478
less than an hour (Min 1min = 0.0166)	8	0.508	4.064	-4.98345098	24.83478367	198.6782694
sum	51	19.008	280.064	-2.957803922	119.369199	1575.106785
mean = sum f*m/ sum f	**5.49145098**					
Variance (s^2)	**31.50213569**					
standard deviation (s) [sqrt((f*(x-mean)^2)/(sum f - 1)]	**5.61267634**					

Conclusion: We know that 31.4 % plays 3 hours per day, 29.4% plays 4 hours or more per day, 23.5% plays 1 -2 hours per day, and 15.7 % plays less than an hour per day. The variance is 31.5 and standard deviation is 5.612 between mean to all the grouped data's.

5. In the past 30 days, which of the following devices have you used to play video games? (Please select all that apply.)

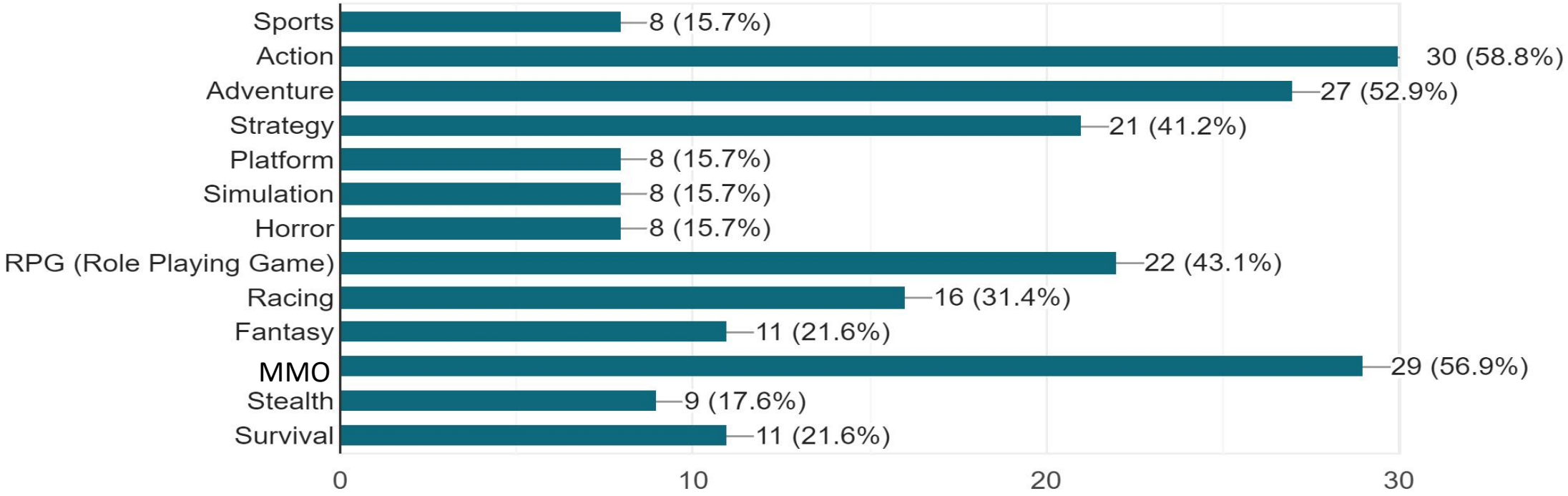
51 responses



Conclusion: 72.5% use Desktop/Laptop computer, 56.9% use smartphone, 23.5% use tablet, 35.3% use Gaming consoles. From this, the desktop/Laptop is the most used for video games , as they have much more accessibility amongst people.

6. Which of these genre of video games do you play the most? (Maximum of 6 options)

51 responses



Conclusion: 58.8% play action games, 56.9% play MMO games, 52.9% play Adventure games, 43.1% play RPG games, 41.2% play Strategy games, 31.4% play racing games, 21.6% play fantasy games and survival games, and 15.7% play sports, platform, simulation and horror games. From this, action and MMO being played the most indicates the majority of the players that play video games, MMO are never ending games and can keep going if they have social support.

7. How much money have you spent on video games in the past 12 months? (This includes Micro-transac...made within games using real money.)

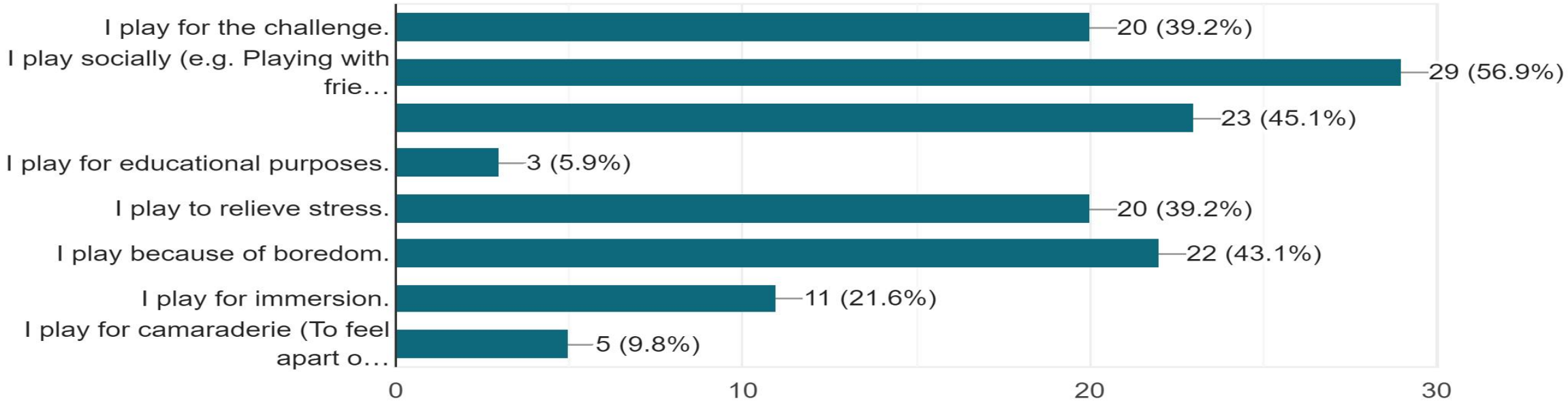
51 responses

7. How much money have you spent on video games in the past 12 months? (This includes Micro-transactions, which are small purchases made within games using real money.)	Frequency (f)	Midpoint (m) or x	f*m	x mean (m - mean age)	(x-mean)^2	f* (x-mean)^2
Rs. 1,001 - 3,500	8	2250.5	18004	-1958.568627	3835991.068	30687928.55
Rs. 3,501 - 5,000	6	4250.5	25503	41.43137255	1716.558631	10299.35179
Rs. 50 - 200	6	125	750	-4084.068627	16679616.55	100077699.3
Rs. 201 - 1,000	9	600.5	5404.5	-3608.568627	13021767.54	117195907.9
None	15	0	0	-4194.068627	17590211.65	263853174.8
Greater than Rs. 10,000	5	30000	150000	25790.93137	665172141.1	3325860705
Rs. 5,001 - 10,000	2	7500.5	15001	3291.431373	10833520.48	21667040.96
sum	51	44727	214662.5	15278.51961	727134964.9	37083883211
mean = sum f*m/ sum f	**4209.068627**					
Variance (s^2)	**741677664.2**					
standard deviation (s) [sqrt((f*(x-mean)^2)/(sum f - 1)]	**27233.75964**					

Conclusion: From the above pie chart, the individual spending's % is understood. The standard deviation is 27233, the deviation is large due to assuming a large sum of money for greater than 10,000 for taking a mid point.

8. What reasons does playing video games most applies to you? (Maximum of 3 options)

51 responses



Conclusion: From the above bar graph, the individual reasons for playing video games can be understood. The main reason which most of the gamers play these video games if cause they get to play socially with friends and other strangers, and this helps them cower from their social anxiety, this is why majority of the gamers are addicted.

9. What video game feature is most appealing to you?

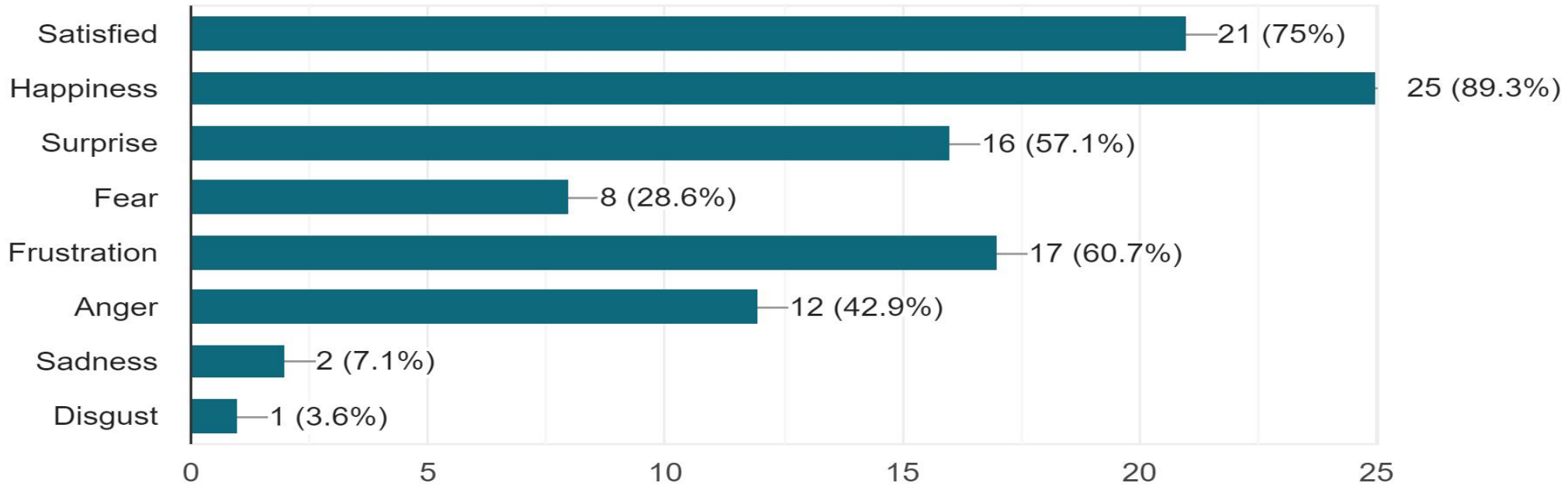
51 responses

9. What video game feature is most appealing to you?	Frequency (f)
Social features (Being able to play with friends or strangers).	12
Reward and Punishment features.	3
Mastering complex and challenging control schemes.	16
Narrative and Identity (Character customization and progression).	13
Graphics and aesthetics .	7
sum	51

Conclusion: From the above pie chart, the most appealing feature is the Mastering complex and challenging control schemes, after which is the Narrative and identity. The following features make the video games immersive.

10. What emotions have you felt the most when you have played video games? (Leave this question unanswer...deo games) - (Maximum of 4 options)

28 responses



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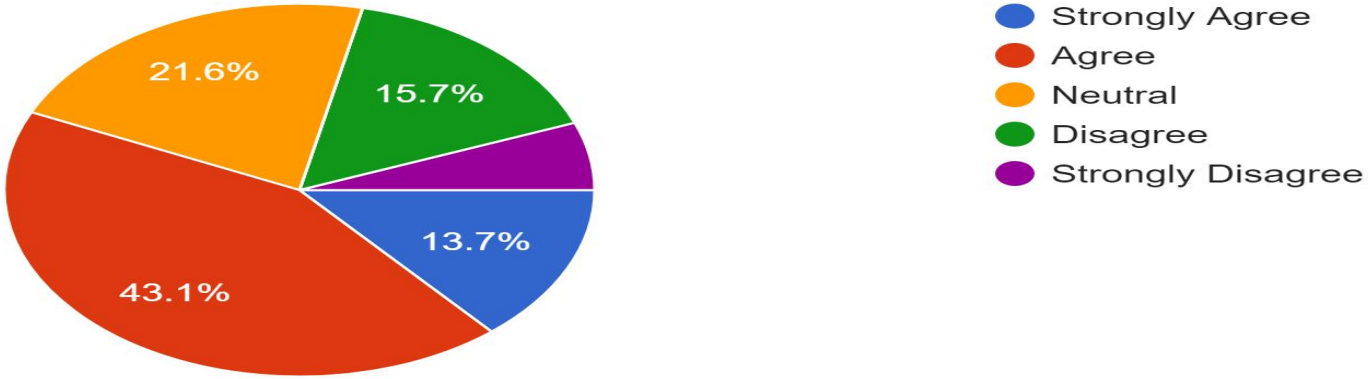
11. Do you think about playing video games while you are not playing them?

51 responses

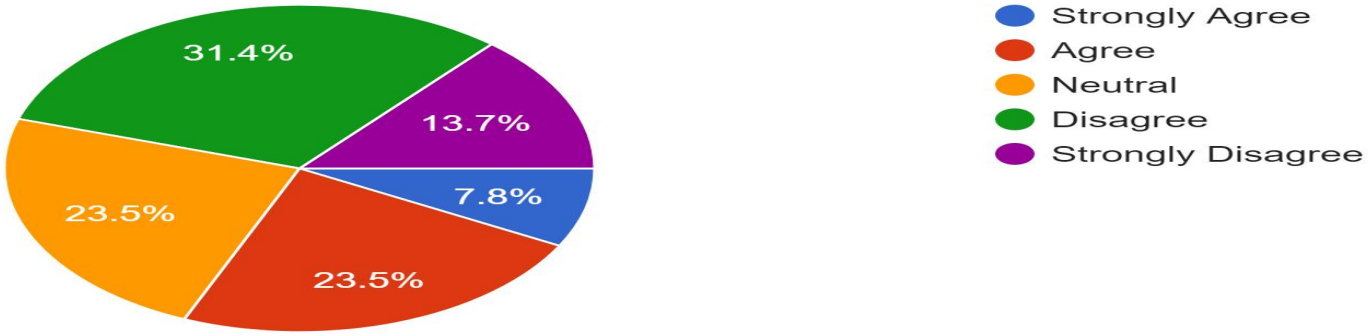


11. Do you think about playing video games while you are not playing them?	Frequency (f)
Strongly Agree	7
Agree	22
Neutral	11
Disagree	8
Strongly Disagree	3
Sum	51

Conclusion: From the following responses, 43% agree that the video games are thought of even when they are not being played. This means that, the games do affect them, with their decisions on things and play a role in priority and decision making.

12. Does playing video games ever take priority over performing daily tasks ?

51 responses



12. Does playing video games ever take priority over performing daily tasks ?	Frequency (f)
Strongly Agree	4
Agree	12
Neutral	12
Disagree	16
Strongly Disagree	7
Sum	51

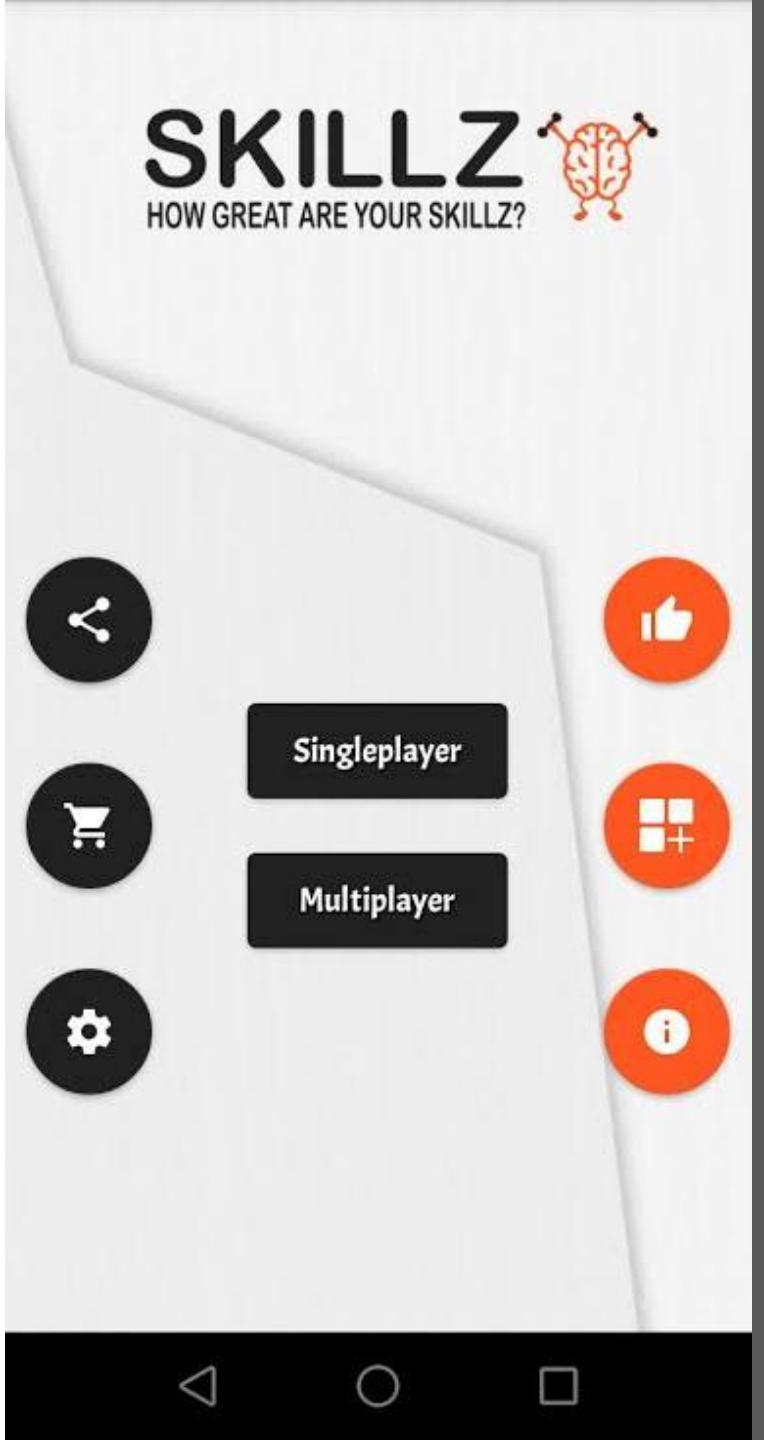
Conclusion: 45.1 have disagreed and strongly disagreed while rest 47% have agreed and strongly agreed. That means that, a portion of the video gamers play it for just passing on time, while the other portion play it overtaking other priorities. This can be part of the negative effects of gaming as this priority will reduce the work efficiency in a population due to such addiction.

Results from the survey

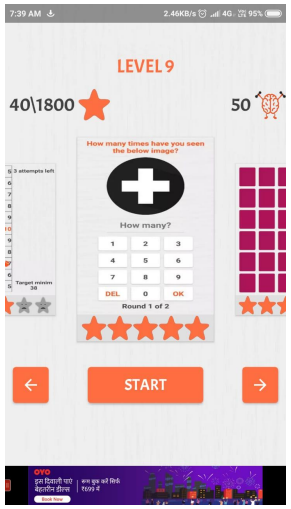
- From the survey, we can conclude that males in the age group between 19 – 24, that play multiplayer games for more than 4 hours a day in a laptop or desktop and spend more than Rs.10,000 per annum on video games, that play for social interaction and let the video games affect them by thoughts and priorities are the video gamers that are experiencing the negative effects of video games.
- These individuals could be diagnosed video game addiction disorder. These individuals are amongst us, they should be compelled into attending rehabilitation centers as this condition could affect their life. These individuals are not certain with what to do with their life and end up pushing themselves down even though they might have the potential to do something great.

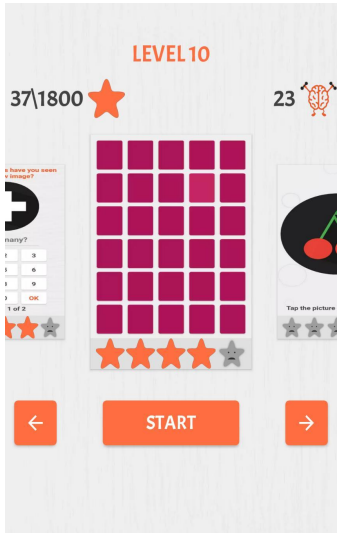
Our Experiment

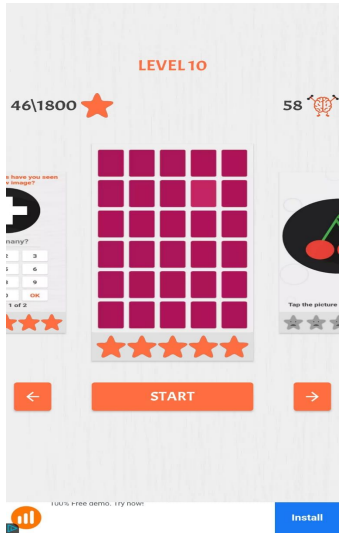
- We asked people to play brain games up to level 10 of this app, and then the star rating is recorded and the results are compiled. From this experiment the cognitive abilities of video gamers and non video gamers is checked. This help us understand how video games affect their cognitive abilities.
- We used the app “Skillz – Logical Brain Games”
- https://play.google.com/store/apps/details?id=net.rention.mind.skillz&hl=en_IN
- https://apps.apple.com/us/app/skillz-logical-brain-game/id1261485835

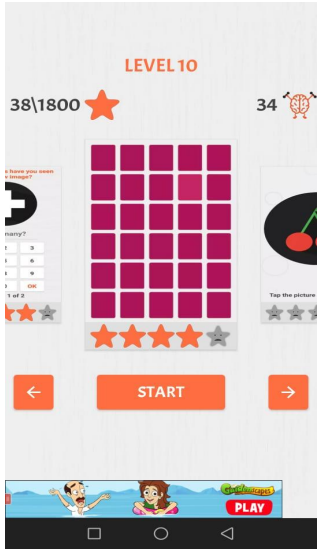


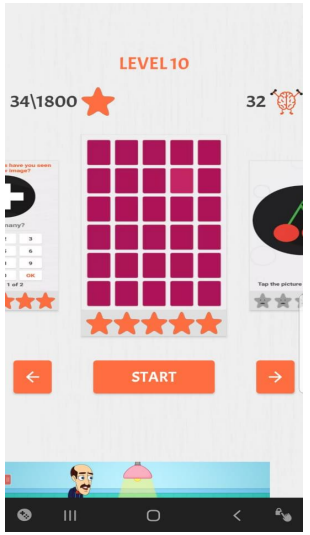
Observations

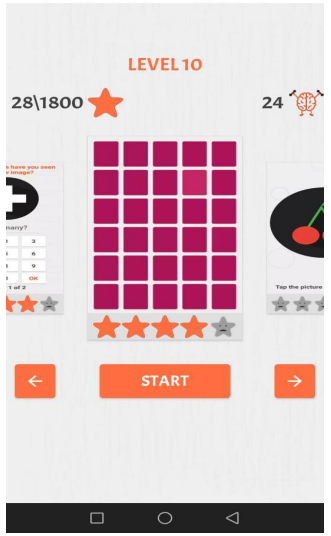


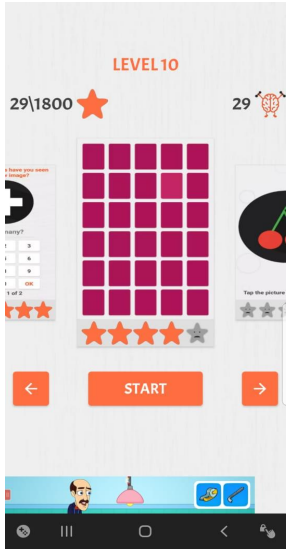


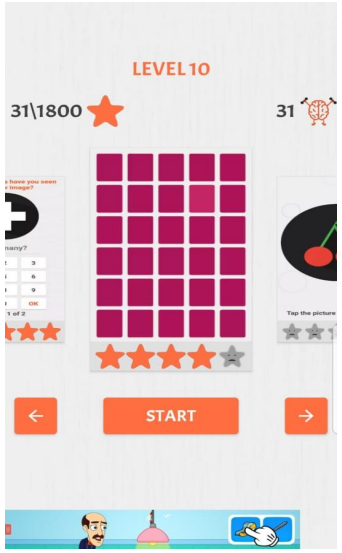


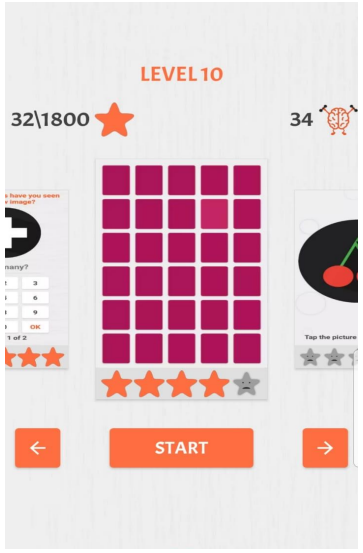


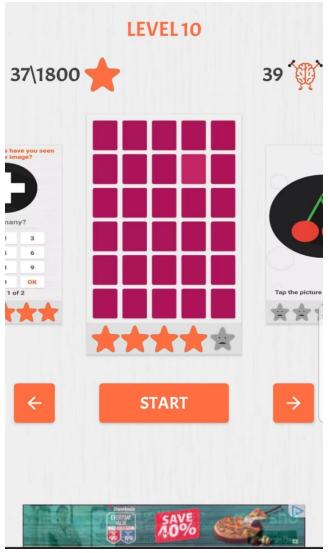


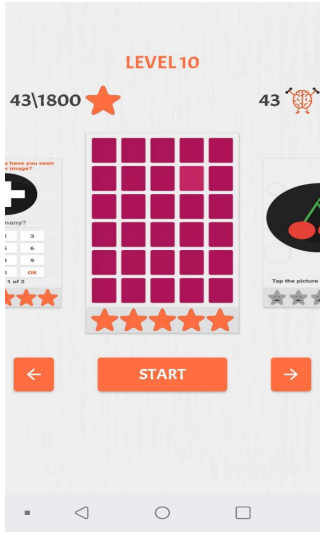


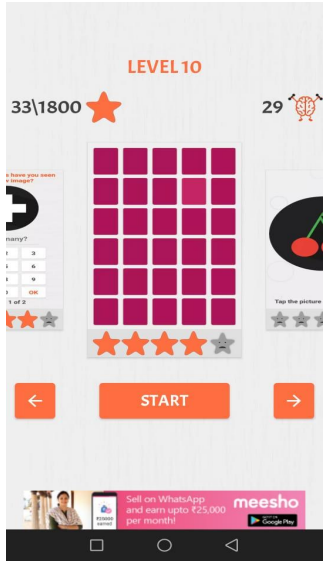








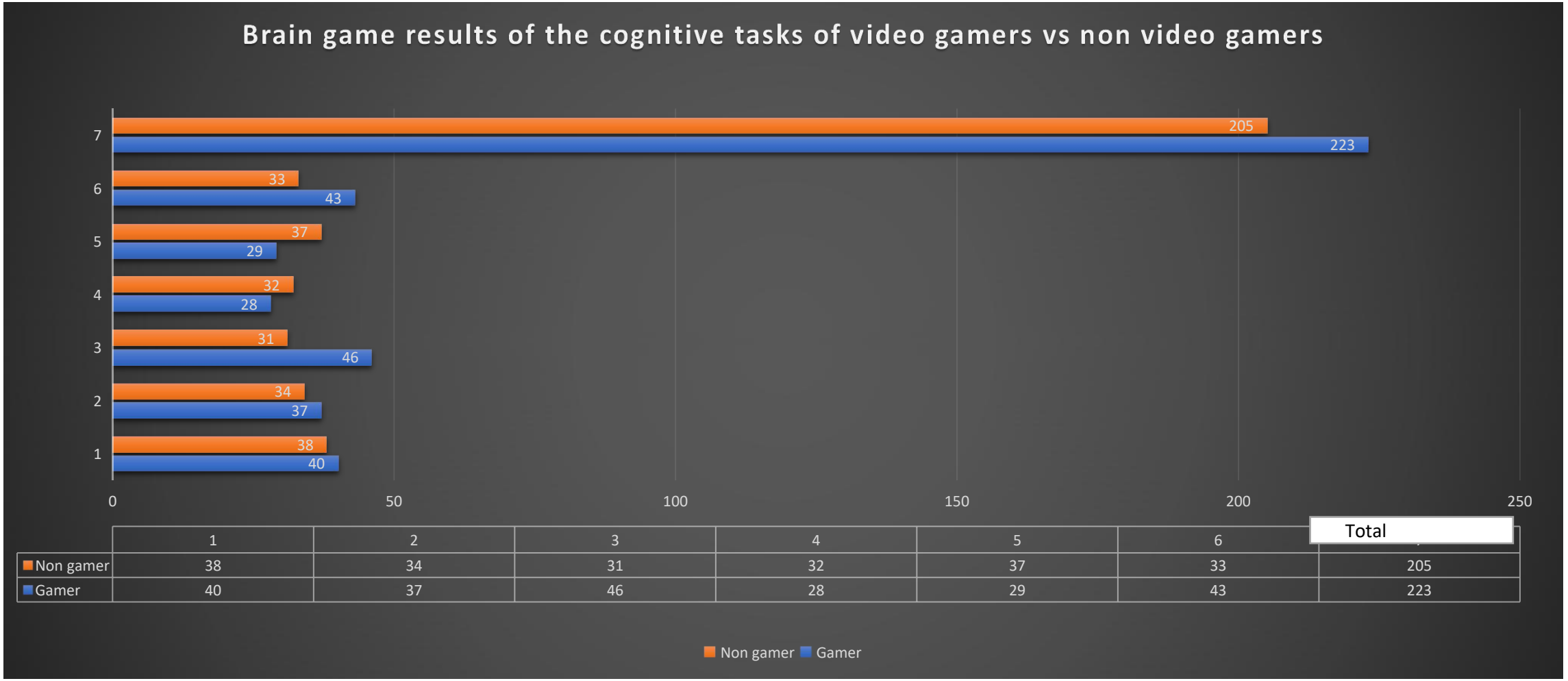




- We got a few more observations of people who already finished 20+ levels of the game, they only mentioned the number of stars for each 1 – 10 levels, so we aren't considering those, and from using the above observations out of 50 points:

S.NO	GAMER	NON GAMER
1	40 points	
2	37 points	
3	46 points	
4		38 points
5		34 points
6	28 points	
7	29 points	
8		31 points
9		32 points
10		37 points
11	43 points	
12		33 points
Total	223 points	205 points

Graph from the experiment



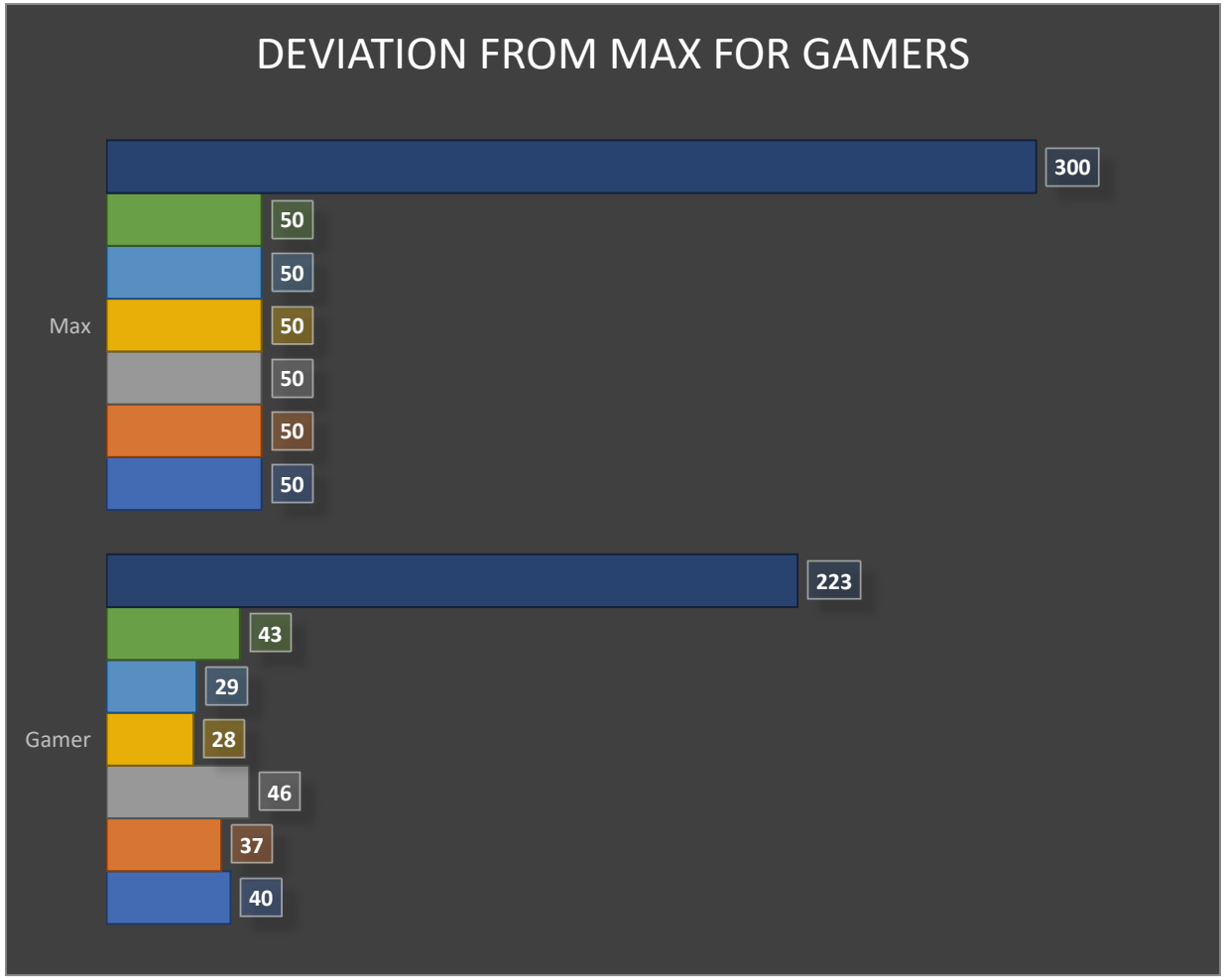
	1	2	3	4	5	6	Total
Non gamer	38	34	31	32	37	33	205
Gamer	40	37	46	28	29	43	223

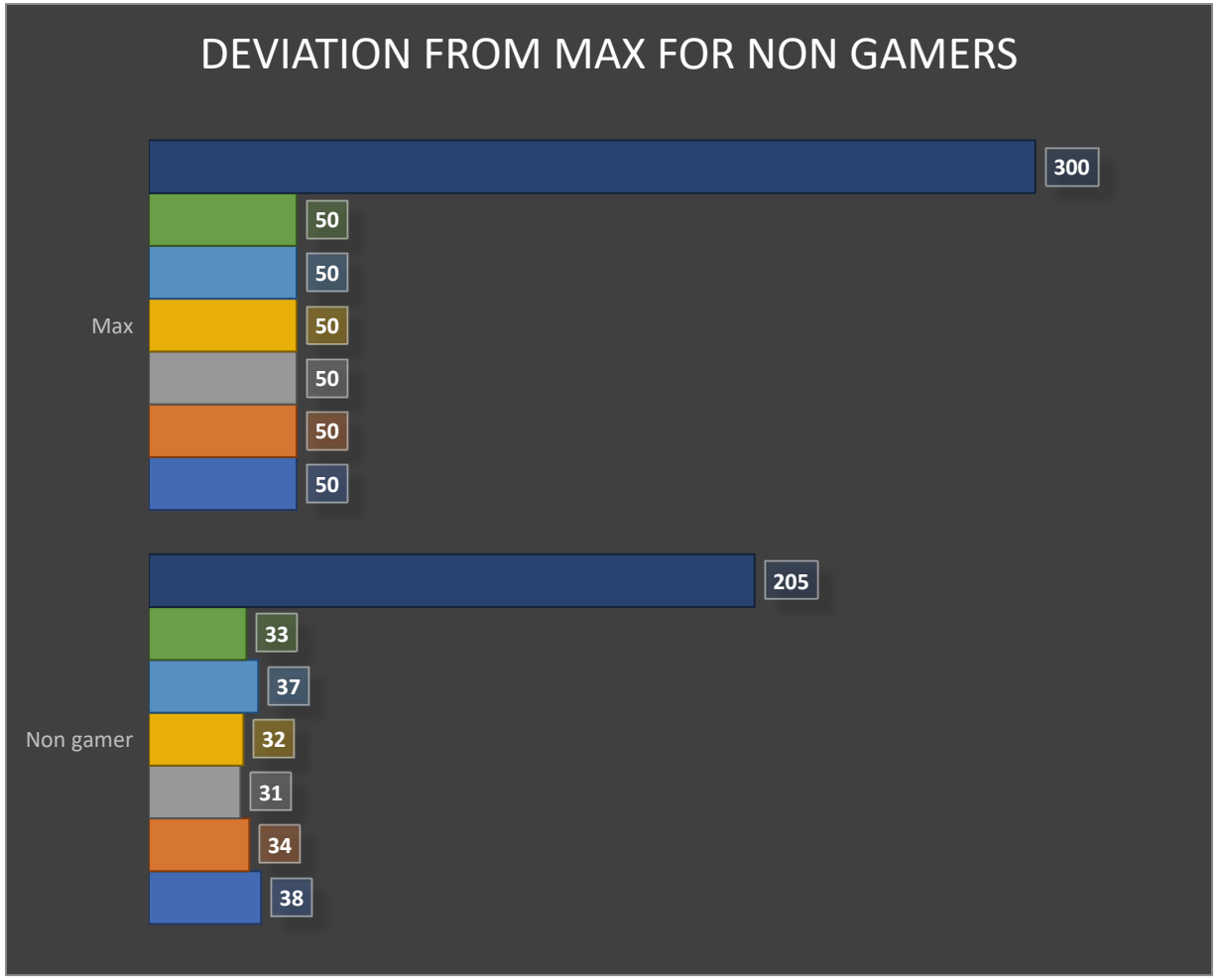
Graph for deviation from maximum for both non gamers and gamers

- The maximum score possible is 50 for level 1 – 10 and the maximum score obtained is 46, so the maximum total or sum is 300. The difference from max:
- **For gamers:** 300 – 223 = 77
- **For non gamers:** 300 – 205 =95

The bar graph for deviation from max is plotted as follows:

Graph for deviation from maximum for both non gamers and gamers





F-TEST of the experiment

- An F-test is any statistical test in which the test statistic has an F-distribution under the null hypothesis. It is most often used when comparing statistical models that have been fitted to a data set, in order to identify the model that best fits the population from which the data were sampled.
- In the experiment, the F-test is checked to see which model is best for the population which is being sampled. The following table, is to check whether the two population follow null hypothesis.

F-TEST TABLE

	Variable 1 (non gamer)	Variable 2 (gamer)
Mean	34.16666667	37.16666667
Variance	7.766666667	54.16666667
Observations	6	6
df	5	5
F	0.143384615	
P(F<=f) one-tail	0.026289416	
F Critical one-tail	0.1980069	

From this Table, As 0.1433 is lower than 0.198, the null hypothesis is accepted and hence the variables of the two populations are equal.

Results from the experiment

- From the table, we understood that the number of gamers that played have mixed reults in case of points while the non gamers had a more consistent score. However, from totaling the scores, the total for gamers is more.
- Video gamers that play games related to games related to interface for a prolonged period of time, it becomes an instinct to them and because of this instinct, their reflex and cognitive abilities almost match up to the instincts required in our day to day life.
- From the F-test of the experiment, as F value is lower than F critical one tailed hence both the variables follow null hypothesis, this means that both the populations are equal.

Discussions

- From the cited research paper, it suggests that video games, increase performance of cognitive tasks in several domains including visual attention, visual short-term memory, executive function, and procedural learning abilities but only in spatial memory strategies[2].
- The reason why video game addiction is considered as a disorder is because some individuals become lost between the virtual world and reality. Because they are completely immersed into the game “they want to keep playing and playing non stop” and if resisted upon, they show aggression and compulsive type of behavior.
- Video game addiction can result in isolation, fatigue and depression. The drug that is prescribed by doctor for such addiction is Wellbutrin, which can help lessen the negative effects of video games [4].
- The response learners displayed a bilateral decrease in grey matter within the hippocampus at post-training and the interaction analysis revealed no significant difference, suggesting that training impacted different regions of the hippocampus of spatial and response learners [2]. This suggests that there is decrease in grey matter within the hippocampus on exposure to videogames on response strategies, which is question and answer based strategies which is part of most of the education systems.

Conclusion for the project

- From the survey, we can conclude that males in the age group between 19 – 24, that play multiplayer games for more than 4 hours a day in a laptop or desktop and spend more than Rs.10,000 ($125) annually on video games. They play for social interactions with other players online, which results in anxiety depression and other issues on social interaction in real life.
- From the experiment, both the population of gamers and non gamers on F-test, follow null hypothesis and hence both populations are equal. The video gamers have better spatial memory than the non video gamers. Hence, a portion of the video gamers have better result in this experiment.
- From the cited research paper [2], there is a decrease in the grey matter in the hippocampus on exposure to video games, hence, video games have negative effect on exposure to a population of individuals on response strategies.

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