Exploring the Intersection of Microtransactions, Loot Boxes, and Gender-Based Cyberbullying in Female Adolescents

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Abstract
The growing concerns in the online gaming world has led to many risks that are faced by a certain section of the gamers. This includes the female adolescents who undergo a number of challenges in their gaming journey. It includes being bullied or facing gender based discrimination. In order to investigate the same, the study includes the provision of microtransactions and how it can impact on these challenges among gamers. The 600 primary datasets considered for the statistical analysis are collected using purposive sampling. It is divided equally among the female adolescent gamers in the age group of 13 to 19 years and studying either in private or government schools and colleges. The results from the mean score analysis among these different groups of gamers categorised based on their educational institutes showed interesting results. It is seen that while the overall mean scores are comparatively at a similar level for the variables of — gender biased behaviour and cyberbullying, level of engagement in microtransactions and perception about microtransactions. The private school students exhibit a higher level of engagement in the microtransaction as compared to the other. While all categories of gamers agree to know about the risks and consequences of getting involved in such transactions. It can be estimated from the analysis that these adolescent female online gamers hold a sensible level of understanding on the monetising options of the gaming platforms and can be estimated to use them effectively despite the difference in their types of educational institutes. These differences upon being measured using the t-test tools shows a significant difference in the mean scores highlighting the validity of the responses statistically. The analysis also revealed that all these responses agree to have a disturbance in their gaming experience due to their gender.

Keywords – Microtransactions; Loot; Boxes; Adolescents; Cyberbullying; Female

Introduction
The online gaming industry is increasing at a fast pace. According to (Statista Research Department, 2024), the number of gamers across the world will reach 1.2 billion by 2027 and the market is potentially increasing at a rate of 5.20%. This shows that this form of gaming has become one of the highly sought-after recreational activities that is preferred by individuals across the world. It is, however, essential to mention that in certain cases the gaming world can bring a number of psychological challenges to these individuals (Saarinen, 2017). Researchers consider two categories of users to be highly vulnerable to this situation. Firstly, adolescents who are in a transformative era of their life and do not have a proper decision-making ability (Balci & Salah, 2015; Huang et al., 2021). They can fall prey to a number of difficult situations in the virtual world leading to serious damages in the real world. The second category of users are female gamers who also undergo a number of discrimination in this aspect (Fox & Tang, 2017; Yıldırım, 2022). The gaming one is often stereotyped to be mean which leads to the female gamers as an unfit combination. This leads to certain behaviour such as gender biased discrimination leading to even cyber bullying that causes the female rumours to be in a difficult situation (Zhao et al., 2020). The study here combines these two categories for users who are identified under tremendous trade in the online gaming world and at times to understand more about female adolescent gamers and their perception on gender biased experiences and cyber bullying. Along with investigating this perspective, the study also includes the role played by monetisation formats of the gaming platforms such as micro transactions in the form of loot boxes and their impact on this situation. The researchers believe that one of the reasons why gamers get involved in micro transactions are to feel inclusive and detach from discriminatory remarks. Why the female gamers are often subjected to such discrimination, understanding if their involvement in purchasing the online gaming elements which require the real world monetary exchanges can cause an impact. This study is a novel attempt in integrating such important aspects of the online gaming platform and at times to answer the questions arising in this regard.

The following research questions are generated to understand the situation described above and derive answers.
RQ1: What is the perspective of the online female gamers on the cyberbullying and gender biased behaviour that they are exposed to?
RQ2: How is the involvement in microtransactions among the adolescent female online gamers on the cyberbullying and gender biased behaviour shown towards the online gamers?
RQ3: Does belonging to either a government or private educational institute or being a part of a school or a college differ in their responses towards this situation?

The methods of analysing the above questions are discussed in the upcoming sections along with a detailed analysis of the current literature on online gaming.

Review of Literature

The online gaming domain is widely researched in the current literature. It has been conducted from the point of view of providing maximum information on the opportunities and risks that it can carry(Hilvert-Bruce & Neill, 2020; Prasetyaningtyas & Prayogo, 2021). With the use of online give me platforms for recreation, it became a source of addiction for a large number of users. Research exploring the behaviour in the context of using online gaming investigated across different levels (Ferretti et al., 2008). In the world of gaming, the players assume a virtual identity which also brings with it a number of complications. Known as a massively multiplayer online gaming platform, the creation of the virtual world is such that a new identity is constructed for every user (Melodia et al., 2022). The role playing generated at this level of thing and escape pod for the users and creates a difference from the actual reality. The negative aspects of such a situation has been suggested to include psychological problems such as being aggressive, generating hostile behaviour, increased level of stress, inability to cope up with the situation and high level of loneliness (Canale et al., 2019; Lemmens et al., 2011; Pontes, 2017). The research in gaming is primarily found to move around understanding the psychological repercussions of such involvement. The impact of gaming can be diverse across different groups of users (Wang et al., 2021). However, the chances of developing an inclination towards loneliness which eventually can lead to anxiety and depression is found to be very evident (Rho et al., 2017). There are chances of developing high risk psychological distractions that can cause a significant impact on the real life of the individuals. Apart from the psychological ethics, several physiological difficulties can also be checked. For example, developing musculoskeletal diseases which impact on the physical formation of the user and leading to conditions such as development of chronic pain at a relatively younger age can occur (Hellström et al., 2015). An investigation across at present suggests that researchers have developed a keen eye into the problems from such behaviour and provided a number of significant understanding. .With the development of monetisation strategy of the gaming platforms which include involvement of microtransactions can cause several challenges with the already existing concerned environment (McCaffrey, 2019; Neely, 2021). There are chances that with the presence of such options, the gaming scenario can significantly alter. While all involved in monetary exchanges can benefit in their performance, those who cannot afford such a provision might face an explosion from the community (Zendle et al., 2020). This situation becomes even more critical when female adolescent gamers are involved who are not in possession of such privileges to a large extent. The addition of further difficulties into the stereotyped environment for female gamers can be increased with such a situation. This study would contribute to the existing literature by showing the situation with respect to this condition of understanding the female adolescent gamers based on the educational institute they go to. The environment in which the gamers are continuing their education can be of significant importance in such a situation and hence a consideration of it will also be done in the study here.

Research Methodology

The section here in the study is established to build the surrounding methodology for conducting the study. It is essential to make these frameworks rigorous in order to ascertain that the study is conducted with a minimum error and biases. The study here is considering the relationship between the microtransactions done in the online gaming world with the cyberbullying level that these respondents suffer. The case of cyberbullying is very concerning in case of online gamers and can lead to a number of serious consequences. The methodology designed here is with the perspective of understanding this situation appropriately.

The study here takes a quantitative approach and is descriptive in nature. The aim of the study is to generate more knowledge on the topic of cyberbullying and microtransactions and hence, the use of primary data would be the most applicable. The study however, utilises secondary sources of data as well. The secondary data sources include books, journal articles, reports and online authentic sources on the topic. The data collection process involves a more strict process and is discussed here.

The data collection through primary sources include the population of adolescent girls who are gamers and belong to the Delhi NCR area. This area has been selected as it is one of the developed regions in India and consists of a significant level of gamers in the present times. The sampling technique used is purposive sampling where the inclusion criteria include being an adolescent in the age of 13 to 19 years of age. Moreover, these girls need to be an active gamer who must be involved in gaming at the time of conducting the study. Moreover, the study attempts to understand the differences in opinion among the respondents based on their educational institution. Therefore, equal numbers of girls are to be considered from schools and colleges from both government and private instruction. The composition to be considered during the study for the samples including the minimum sample size determination by (Krejcie & Morgan, 1970) of 384 for an infinite population is as follows-

Institution Type	Sample Size Distribution
Adolescent Girls in Government Schools	150
Adolescent Girls in Private Schools	150
Adolescent Girls in Government Colleges	150
Adolescent Girls in Private Colleges	150

A total of 600 responses are to be collected in the study. A structured questionnaire is designed for the purpose of estimating each of the variables quantitatively and collecting the responses from the population of the study. The questionnaire designed is in a five point Likert type scale that promotes the responses in a continuous rating scale.

The detailed investigation in the previous literature has established the measurement of this situation with relevance to other variables which would play different roles in the conceptual model. The list of variables included and their definitions are as follows –

Variable Name	Definition	Role in the Conceptual Model
Gender Biased Behaviour and Cyberbullying	The level of gender based behaviour exhibited by the online gamers perception of the female gamers towards it	Dependent Variable
Level of Engagement	The level of engagement of the individual in the microtransactions offered by the online gaming platforms	Independent Variable
Perception on Microtransactions	The overall perception derived by the female adolescent gamers on the consideration of microtransactions	Independent Variable

The conceptual model hereby developed for the purpose of the study is as follows-
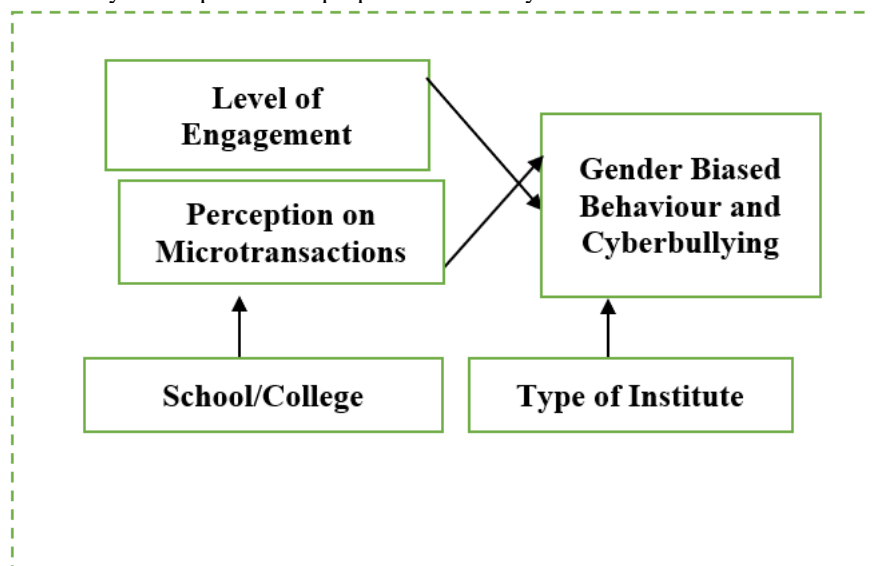
The hypotheses to be tested as a part of the statistical analysis are as follows-

H_{01}: There is no significant impact of the level of engagement of the female adolescent gamers on the gender biased and cyberbullying behaviour experienced.

H_{02}: There is no significant impact of their perception on microtransactions of the female adolescent gamers on the gender biased and cyberbullying behaviour experienced.

H_{03}: There is no significant difference on the gender biased and cyberbullying behaviour experienced by the female adolescent gamers based on the type of institute the gamers are in.

H_{04}: There is no significant difference on the gender biased and cyberbullying behaviour experienced by the female adolescent gamers based on the belonging of the respondents to a school or college.

H_{05}: There is no significant difference on the overall perception of the female adolescent gamers on microtransactions based on the type of institute the gamers are in.

H$_{06}$: There is no significant difference on the overall perception of the female adolescent gamers on microtransactions based on the belonging of the respondents to a school or college.

The conceptual model designed above attempts to investigate the relationship across the five established variables. It would be done by using regression models to examine the role of variables and their relationships. The factors would be confirmed using principal component analysis (PCA) while the demographic associations would be tested using t-test and one-way ANOVA.

The next section is dedicated towards providing the detailed data analysis process conducted to fulfil the research questions established in the study.

Data Analysis and Interpretation
The collected datasets would be analysed in this section of the study where a detailed review of the items corresponding to the two scales used are done. The analysis would involve understanding each of the items with respect to the two conditions on the type of institutions.

The dependent variable of Gender Biased Behaviour and Cyberbullying and investigation on the two variables of microtransactions which act as the independent variables for the study which would be analysed with respect to the female adolescent gamers in their gaming activities. The questionnaire used for the study includes a total of 13 items for the first variable and 15 items for the second scale that represent the different instances in the situation. The descriptive analysis of these items are shown below. A division in understanding the responses are done based on two demographics specified in the conceptual model above.

Private College Going Gamers
This section investigates the students who are studying in private colleges and includes a total of 150 responses.

Frequencies of Age (in years)

Age (in years)	Counts	% of Total	Cumulative %
15-16	60	40.0 %	40.0 %
16-17	29	19.3 %	59.3 %
17-18	31	20.7 %	80.0 %
18-19	30	20.0 %	100.0 %

The age group frequency levels show that the respondents are majorly in the age group of 15-16 years with 40%. There are no respondents in this category below the age of 15 years due to the enrolment criteria required in the colleges. The mean score analysis for this group of respondents is provided in the next tables.

Descriptives

	N	Mean	Median	SD	Minimum	Maximum
I have experienced discrimination harassment based on my gender while gaming	150	2.79	3.00	1.149	1	5
I have experienced verbal harassment based on my gender while gaming	150	2.97	3.00	1.129	1	5
Gender differences impact the way players interact with each other in online gaming communities.	150	2.99	3.00	0.897	2	5
My gender influences my gaming experiences.	150	3.78	4.00	0.904	2	5
I feel pressure to conform to gender norms while gaming	150	2.63	2.00	0.937	2	5
Video game marketing often targets specific genders.	150	3.57	3.00	1.195	2	5

Descriptives

	N	Mean	Median	SD	Minimum	Maximum
I avoid female avatars	150	3.62	3.00	1.174	2	5
I try to pass as male	150	3.18	3.00	1.124	2	5
I use gender neutral user name	150	3.35	3.00	1.050	2	5
I avoid talking to others while playing	150	2.63	2.00	0.937	2	5
I avoid voice chat	150	3.43	3.00	1.077	2	5
I try to forget any such discrimination	150	3.75	4.00	1.010	2	5
I report harasser immediately	150	3.31	3.00	1.337	2	5

In case of gender biased behaviour and cyberbullying, the highest mean score is seen to be for the item representing a high level of agreement on their gender influencing their experiences in gaming with a score of 3.78. It is followed by a score of 3.75 for the item showing almost as high agreement for trying to forget any such exhibited behaviour. The lowest score stands at 2.63 which shows low agreement among the gamers about avoiding talking during playing because of such instances. This analysis reflects the agreement of the respondents to such experiences and having an impact on their gaming journey.

Descriptives

	N	Mean	Median	SD	Minimum	Maximum
Level of Engagement						
Engaged in 1 activity: Obtained loot box	150	2.79	3.00	0.791	2	4
Engaged in 1 activity: Bought loot box	150	2.32	2.00	0.468	2	3
Engaged in 1 activity: Sold items from loot box	150	2.68	2.00	0.822	2	4
Engaged in 2 activities: Obtained and bought loot box	150	2.68	2.00	0.822	2	4
Engaged in 2 activities: Obtained and sold items from loot box	150	2.68	2.00	0.822	2	4
Engaged in 2 activities: Bought and sold items from loot box	150	2.51	2.00	0.809	2	4
Engaged in all 3 activities	150	2.51	2.00	0.809	2	4
Not engaged in any form	150	3.08	3.00	0.661	2	4
Perception on Microtransactions						
I am cautious about spending money on microtransactions and loot boxes	150	2.70	3.00	0.693	2	4
I have spent more money than I intended on microtransactions or loot boxes.	150	2.32	2.00	0.468	2	3

Descriptives

	N	Mean	Median	SD	Minimum	Maximum
I feel guilty after spending money on microtransactions or loot boxes.	150	3.02	3.00	0.815	2	4
Microtransactions and loot boxes enhance my gaming experience.	150	2.78	3.00	0.810	2	4
I am aware of the potential risks associated with spending money on microtransactions and loot boxes.	150	3.09	3.00	0.583	2	4
I am able to resist the urge to spend money on microtransactions and loot boxes.	150	2.59	2.00	0.716	2	4
I actively limit my spending on microtransactions and loot boxes to avoid financial consequences.	150	3.03	3.00	0.714	2	4

For the enquiry on microtransactions, it is seen that level of engagement when analysed through the mean scores exhibits a relatively low score on each item where the average can be spotted around 2.5. This score shows that respondents are not actively involved in such transactions with the majority agreeing to not being engaged in any form of such microtransactions. On the other hand, the investigation on the items of perception about microtransactions, it is seen that the highest score stands at 3.03 where they highly agree on being aware about the risks associated with such involvement and limiting such spending knowing about the financial consequences. This analysis reveals that the respondents are highly aware of these monetizing methods by the gaming companies and are mostly not engaged with such microtransactions.

Private School Gamers

The next set of responses include the female gamers who are currently a part of the private schools for their educational curriculum. The age group division of these respondents are as follows-

Frequencies of Age (in years)

Age (in years)	Counts	% of Total	Cumulative %
15-16	61	40.7 %	40.7 %
13-14	89	59.3 %	100.0 %

The respondents from this demographic division include the majority of the students in the age group of 13 to 14 years with 59.3%. There are also 40.7% respondents who are in the age group of 15 to 16 years of age.

Descriptives

	N	Mean	Median	SD	Minimum	Maximum
My gender influences my gaming experiences.	150	3.77	4.00	0.899	2	5
I feel pressure to conform to gender norms while gaming	150	2.64	2.00	0.936	2	5
Video game marketing often targets specific genders.	150	3.54	3.00	1.179	2	5
I avoid female avatars	150	3.59	3.00	1.183	2	5

Descriptives

	N	Mean	Median	SD	Minimum	Maximum
I try to pass as male	150	3.23	3.00	1.138	2	5
I use gender neutral user name	150	3.33	3.00	1.060	2	5
I avoid talking to others while playing	150	2.64	2.00	0.936	2	5
I avoid voice chat	150	3.41	3.00	1.063	2	5
I try to forget any such discrimination	150	3.77	4.00	1.019	2	5
I report harasser immediately	150	3.29	3.00	1.344	2	5
Gender differences impact the way players interact with each other in online gaming communities.	150	2.97	3.00	0.919	2	5
I have experienced verbal harassment based on my gender while gaming	150	2.95	3.00	1.143	1	5
I have experienced discrimination harassment based on my gender while gaming	150	2.78	3.00	1.146	1	5

The analysis about gender biased behaviour and cyberbullying experiences, the mean scores are found to be relatively higher than the previous group of respondents. There are multiple items that show a high level of agreement with mean scores being above 3.5. This includes the highest score of 3.77 showing the agreement among the adolescents about gender based experiences influencing their gaming experiences. It shows an equal agreement about trying to forget such experiences. There are also high inclinations towards responses such as video game marketers targeting male audiences and avoiding female avatars during gaming are observed. The lowest agreement however, is with respect to conforming with gender norms when playing. Based on the school and college students both however, in private institutes, there are certain differences in opinion observed.

Descriptives

	N	Mean	Median	SD	Minimum	Maximum
Level of Engagement						
Engaged in 1 activity: Obtained loot box	150	2.76	3.00	0.792	2	4
Engaged in 1 activity: Bought loot box	150	2.33	2.00	0.473	2	3
Engaged in 1 activity: Sold items from loot box	150	2.65	2.00	0.820	2	4
Engaged in 2 activities: Obtained and bought loot box	150	2.65	2.00	0.820	2	4
Engaged in 2 activities: Obtained and sold items from loot box	150	2.65	2.00	0.820	2	4
Engaged in 2 activities: Bought and sold items from loot box	150	2.56	2.00	0.847	2	4
Engaged in all 3 activities	150	2.56	2.00	0.847	2	4
Not engaged in any form	150	2.99	3.00	0.660	2	4

Descriptives

	N	Mean	Median	SD	Minimum	Maximum
Perception on Microtransactions						
I am cautious about spending money on microtransactions and loot boxes	150	2.69	3.00	0.677	2	4
I have spent more money than I intended on microtransactions or loot boxes.	150	2.33	2.00	0.473	2	3
I feel guilty after spending money on microtransactions or loot boxes.	150	2.99	3.00	0.819	2	4
Microtransactions and loot boxes enhance my gaming experience.	150	2.82	3.00	0.786	2	4
I am aware of the potential risks associated with spending money on microtransactions and loot boxes.	150	3.11	3.00	0.581	2	4
I am able to resist the urge to spend money on microtransactions and loot boxes.	150	2.57	2.00	0.698	2	4
I actively limit my spending on microtransactions and loot boxes to avoid financial consequences.	150	3.00	3.00	0.655	2	4

The level of engagement and perception about microtransactions among these respondents also exhibit interesting results. The level of engagement shows a relatively higher level of engagement among the private school gamers than that of the private college gamers. The agreement on not being involved in any form of microtransactions was higher in the previous case, here a score of only 2.56 is found. The highest score with 2.77 reveals the majority of the respondents being engaged in one activity which is obtaining a loot box. The engagement in two activities is also agreed by many gamers with scores of 2.65. On the contrary, investigating the perception of microtransactions, it is seen that the responses are similar. The highest score at 3.11 shows awareness on the risks of such transactions followed by a score of 3.00 on limiting the spends on such transactions. The analysis here reveals the school gamers in private institutes to be more prone to involvement in microtransactions compared to the college going ones.

Government College Gamers
In this section, the analysis is with respect to the college gamers again but those who belong to government institutes. The age group distribution in this category is shown below.

Frequencies of Age (in years)

Age (in years)	Counts	% of Total	Cumulative %
15-16	31	20.7 %	20.7 %
16-17	31	40.0 %	61.7 %
17-18	29	19.3 %	82.0 %
18-19	30	20.0 %	100.0 %

All the respondents are over the age of 15 years and majority are 16 to 17 years of age with 40% of the total respondents. There are 20.7% in the 15-16 years category while 20% in 18-19 years of age.

Descriptives

	N	Mean	Median	SD	Minimum	Maximum
I have experienced discrimination harassment based on my gender while gaming	150	2.77	3.00	1.114	1	5
I have experienced verbal harassment based on my gender while gaming	150	3.03	3.00	1.176	1	5
Gender differences impact the way players interact with each other in online gaming communities.	150	3.01	3.00	0.983	2	5
My gender influences my gaming experiences.	150	3.78	4.00	0.926	2	5
I feel pressure to conform to gender norms while gaming	150	2.69	2.00	0.949	2	5
Video game marketing often targets specific genders.	150	3.57	3.00	1.149	2	5
I avoid female avatars	150	3.52	3.00	1.168	2	5
I try to pass as male	150	3.24	3.00	1.151	2	5
I use gender neutral user name	150	3.31	3.00	1.055	2	5
I avoid talking to others while playing	150	2.69	2.00	0.949	2	5
I avoid voice chat	150	3.47	3.00	1.053	2	5
I try to forget any such discrimination	150	3.79	4.00	1.053	2	5
I report harasser immediately	150	3.39	3.00	1.345	2	5

The gender biased behaviour with cyberbullying experiences shows that the highest mean scores goes up to 3.79. It represents a high level of agreement about trying to forget gender based experiences and 3.78 showing such experiences impacting their gaming. While the majority of the scores are above 3, the lowest score of 2.69 is seen in terms of two items – one representing low agreement about avoiding talking to others in the game and feeling pressured to conform to the gender norms. The results show similarity in response as that of the previous two categories and generates an evident idea towards the presence of such behaviour in the gaming world.

Descriptives

	N	Mean	Median	SD	Minimum	Maximum
Level of Engagement						
Engaged in 1 activity: Obtained loot box	150	2.77	3.00	0.789	2	4
Engaged in 1 activity: Bought loot box	150	2.35	2.00	0.478	2	3
Engaged in 1 activity: Sold items from loot box	150	2.65	2.00	0.819	2	4
Engaged in 2 activities: Obtained and bought loot box	150	2.65	2.00	0.819	2	4

Descriptives

	N	Mean	Median	SD	Minimum	Maximum
Engaged in 2 activities: Obtained and sold items from loot box	150	2.65	2.00	0.819	2	4
Engaged in 2 activities: Bought and sold items from loot box	150	2.60	2.00	0.859	2	4
Engaged in all 3 activities	150	2.60	2.00	0.859	2	4
Not engaged in any form	150	2.93	3.00	0.667	2	4
Perception on Microtransactions						
I am cautious about spending money on microtransactions and loot boxes	150	2.64	3.00	0.648	2	4
I have spent more money than I intended on microtransactions or loot boxes.	150	2.35	2.00	0.478	2	3
I feel guilty after spending money on microtransactions or loot boxes.	150	2.98	3.00	0.823	2	4
Microtransactions and loot boxes enhance my gaming experience.	150	2.78	3.00	0.767	2	4
I am aware of the potential risks associated with spending money on microtransactions and loot boxes.	150	3.13	3.00	0.559	2	4
I am able to resist the urge to spend money on microtransactions and loot boxes.	150	2.53	2.00	0.662	2	4
I actively limit my spending on microtransactions and loot boxes to avoid financial consequences.	150	2.97	3.00	0.623	2	4

The level of engagement among the college going gamers shows majority with a score of 2.93 not being engaged in any form of such transactions. It is similar to the results from the private college students as well. There are the least amount of gamers who are involved in only one activity which is buying a loot box. The perception about the respondents shows that with a 3.13 score, these respondents are highly aware of the potential risks involved in such transactions. It is followed by the majority agreeing on feeling guilty after making such transactions and limiting their spending to avoid financial consequences. The perception based on the responses provided are also found to be similar to that of the previous two groups of gamers.

Government School Gamers

The last division in the study is analysing the individual responses among the gamers who belong to schools but those belonging to the government. The age distribution is as follows-

Frequencies of Age (in years)

Age (in years)	Counts	% of Total	Cumulative %
15-16	59	39.3 %	39.3 %
13-14	91	60.7 %	100.0 %

The 60.7% respondents belong to 13 to 14 years of age while the remaining 39.3% belong to the 15 to 16 years category.

Descriptives

	N	Mean	Median	SD	Minimum	Maximum
I have experienced discrimination harassment based on my gender while gaming	150	2.78	3.00	1.117	1	5
I have experienced verbal harassment based on my gender while gaming	150	3.05	3.00	1.161	1	5
Gender differences impact the way players interact with each other in online gaming communities.	150	3.03	3.00	0.962	2	5
My gender influences my gaming experiences.	150	3.79	4.00	0.931	2	5
I feel pressure to conform to gender norms while gaming	150	2.68	2.00	0.951	2	5
Video game marketing often targets specific genders.	150	3.60	3.00	1.164	2	5
I avoid female avatars	150	3.55	3.00	1.162	2	5
I try to pass as male	150	3.19	3.00	1.137	2	5
I use gender neutral user name	150	3.33	3.00	1.046	2	5
I avoid talking to others while playing	150	2.68	2.00	0.951	2	5
I avoid voice chat	150	3.49	3.00	1.066	2	5
I try to forget any such discrimination	150	3.77	4.00	1.044	2	5
I report harasser immediately	150	3.41	3.00	1.337	2	5

The investigation about gender biased behaviour and experiences of cyberbullying shows that the scores range from 3.79 to 2.68. The highest score reveals the gender of the respondent influencing the gaming experiences. It is closely followed by a high number of respondents agreeing to trying to forget the discrimination they are facing. The lowest score is with respect to avoiding talking to others while being in the game and feeling the pressure to conform to the gender norms. The results are similar to the responses provided by the above group of gamers representing a similar situation and defence mechanism for it.

Descriptives

	N	Mean	Median	SD	Minimum	Maximum
Level of Engagement						
Engaged in 1 activity: Obtained loot box	150	2.79	3.00	0.782	2	4
Engaged in 1 activity: Bought loot box	150	2.33	2.00	0.473	2	3
Engaged in 1 activity: Sold items from loot box	150	2.68	2.00	0.814	2	4
Engaged in 2 activities: Obtained and bought loot box	150	2.68	2.00	0.814	2	4
Engaged in 2 activities: Obtained and sold items from loot box	150	2.68	2.00	0.814	2	4
Engaged in 2 activities: Bought and sold items from loot box	150	2.55	2.00	0.824	2	4
Engaged in all 3 activities	150	2.55	2.00	0.824	2	4
Not engaged in any form	150	2.99	3.00	0.680	2	4
Perception on Microtransactions						
I am cautious about spending money on microtransactions and loot boxes	150	2.65	3.00	0.657	2	4
I have spent more money than I intended on microtransactions or loot boxes.	150	2.33	2.00	0.473	2	3
I feel guilty after spending money on microtransactions or loot boxes.	150	3.01	3.00	0.819	2	4
Microtransactions and loot boxes enhance my gaming experience.	150	2.73	3.00	0.783	2	4
I am aware of the potential risks associated with spending money on microtransactions and loot boxes.	150	3.12	3.00	0.555	2	4
I am able to resist the urge to spend money on microtransactions and loot boxes.	150	2.53	2.00	0.672	2	4
I actively limit my spending on microtransactions and loot boxes to avoid financial consequences.	150	3.00	3.00	0.676	2	4

The level of engagement in the microtransactions like loot boxes shows that majority of the gamers here agree to not being involved in any form of such transactions with a score of 2.99. It is followed by another majority involving only one activity which is obtaining loot boxes. The perception on the microtransactions shows that with a score of 3.12 majority agree about being aware of the situation and risks that these activities can lead on to. There is also high agreement

found on feeling guilty upon making such transactions and limiting their transactions due to financial consequences. The results here are also similar to the previous group of gamers.

The overall analysis of the situation shows the presence of certain similar and certain different situations with respect to the belongingness specification of the study.

Now, in the next section, a table showing an analysis of the overall mean scores are provided.

Category	Mean Score for Gender Biased Behaviour and Cyberbullying	Mean Score for Level of Engagement in Microtransactions	Mean Score for Perception on Microtransactions
Adolescent Girls in Government Schools	3.25	2.65	2.76
Adolescent Girls in Private Schools	3.22	2.64	2.78
Adolescent Girls in Government Colleges	3.25	2.65	2.78
Adolescent Girls in Private Colleges	3.23	2.65	2.79

An almost similar pattern observed in the respondents here. The government school and college gamers represent a comparatively higher level of gender biased behaviour and cyberbullying than the private school and college gamer. The engagement in microtransactions is the lowest among the private schools as compared to the others while the overall sensible perception on microtransaction is found to be the highest among private college gamers. This analysis shows the presence of a slight difference in these scores although these are not that high. In the future, a further analysis on this can generate interesting results.

Independent Samples T-Test – Type of Institute

		Statistic	df	p
Level of Engagement	Student's t	0.0635	598	0.049
Perception on Microtransactions	Student's t	0.0394	598	0.019
Gender Biased Behaviour and Cyberbullying	Student's t	0.0000	598	0.000

Independent Samples T-Test – Ownership of the Institute

		Statistic	df	p
Level of Engagement	Student's t	0.0817	598	0.035
Perception on Microtransactions	Student's t	-0.5388	598	0.009
Gender Biased Behaviour and Cyberbullying	Student's t	0.5392	598	0.000

The t-test results also show that with p-values being less than 0.05, all the differences observed in the mean scores across the three variables are indeed statistically significant.

In the next section, the conceptual model is analysed using all the datasets combined to fulfil the minimum sample size requirements. However, the t

Model Fit Measures

				Overall Model Test			
Model	R	R²	Adjusted R²	F	df1	df2	p
1	0.0767	0.00589	0.00256	1.77	2	597	0.017

Model Coefficients - Gender Biased Behaviour and Cyberbullying

Predictor	Estimate	SE	t	p
Intercept	2.6410	0.3024	8.73	< .001
Level of Engagement	0.1056	0.0683	1.55	0.023
Perception on Microtransactions	-0.0940	0.0866	-1.09	0.278

The regression model generated above shows that the model is significant with p-value of less than 0.05. The adjusted R^2 however, is very small where it shows that with a unit change in the independent variables, there is 0.00256 or 2.56% change in Gender Biased Behaviour and Cyberbullying perceptions developed by the female adolescent gamers. Looking into the independent variables, it is seen that only the level of engagement causes an impact on the gender biased experiences perceived by the gamers.

The status of the hypotheses post the detailed analysis conducted is shown below.

Hypothesis	Status
H_{01}: There is no significant impact of the level of engagement of the female adolescent gamers on the gender biased and cyberbullying behaviour experienced.	Rejected
H_{02}: There is no significant impact of their perception on microtransactions of the female adolescent gamers on the gender biased and cyberbullying behaviour experienced.	Accepted
H_{03}: There is no significant difference on the gender biased and cyberbullying behaviour experienced by the female adolescent gamers based on the type of institute the gamers are in.	Rejected
H_{04}: There is no significant difference on the gender biased and cyberbullying behaviour experienced by the female adolescent gamers based on the belonging of the respondents to a school or college.	Rejected
H_{05}: There is no significant difference on the overall perception of the female adolescent gamers on microtransactions based on the type of institute the gamers are in.	Rejected
H_{06}: There is no significant difference on the overall perception of the female adolescent gamers on microtransactions based on the belonging of the respondents to a school or college.	Rejected

The detailed discussion on the results are analysed above.

Discussion
The growing concerns in the online gaming world has led to many risks that are faced by a certain section of the gamers. This includes the female adolescents who undergo a number of challenges in their gaming journey. It includes being bullied or facing gender based discrimination. In order to investigate the same, the study includes the provision of microtransactions and how it can impact on these challenges among gamers. The 600 primary datasets considered for the statistical analysis are collected using purposive sampling. It is divided equally among the female adolescent gamers in the age group of 13 to 19 years and studying either in private or government schools and colleges. The results from the mean score analysis among these different groups of gamers categorised based on their educational institutes showed interesting results. It is seen that while the overall mean scores are comparatively at a similar level for the variables of — gender biased behaviour and cyberbullying, level of engagement in microtransactions and perception about microtransactions. The private school students exhibit a higher level of engagement in the microtransaction as compared to the other. While all categories of gamers agree to know about the risks and consequences of getting involved in such transactions. It can be estimated from the analysis that these adolescent female online gamers hold a sensible level of understanding on the monetising options of the gaming platforms and can be estimated to use them effectively despite the difference in their types of educational institutes. These differences upon being measured using the t-test tools shows a significant difference in the mean scores highlighting the validity of the responses statistically. The analysis also revealed that all these responses agree to have a disturbance in their gaming experience due to their gender. This is in concordance with the results by (Lopez-Fernandez et al., 2019; McLean & Griffiths, 2019; Müller et al., 2015) where a similar situation is observed. Further, they also agree on forgetting about such experience as the best defence mechanism in their gaming environment. This also is in line with the results by (González-Bueso et al., 2020; Kaye & Pennington,

2016; Nwanosike et al., 2022; Xiang et al., 2022) where a similar approach is seen to be taken be female gamers in such biased situations. However, the gamers agree on feeling obliged to conform to such gender norms which is a positive insight into the situation. The regression model showing the impact of microtransactions and the perception held by these gamers on gender biasness and cyberbullying reveals only the significant impact of level of engagement in microtransactions. The impact however, is quite low and it shows that the consideration of microtransaction engagement by the female adolescent gamers cannot be actively integrated with the gender biased behaviour and cyberbullying seen in the online gaming platforms. The concept of cyberbullying in case of female adolescent gamers needs to be investigated further.

Conclusion and Future Outlook

The role of cyberbullying in online gaming platforms can be very disturbing and cause a permanent impact on the psychological well-being of the gamers. This situation becomes further alarming when the group of gamers include a vulnerable set of children in their transformative years. The level of risk that the adolescent gamers have is higher as compared to other categories of users. The involvement of real-world monetary exchanges further complicates the process. It can give a high level of psychological concerns if microtransactions such as obtaining loot boxes can impact their gaming. It is also observed in the analysis of the study as well that the level of engagement can be slightly associated with the gender based experience perception among the female adolescent gamers. The study has also generated a number of research opportunities in the future. The investigation on the microtransaction involvement can be done in a detailed manner. The specific consideration of loot boxes can be an interesting approach. The comparative analysis of adolescent gamers with other female gamers can be an interesting aspect. Moreover, longitudinal studies in the world of gaming experiences can bring interesting results.

References
1. Balci, K., & Salah, A. A. (2015). Automatic analysis and identification of verbal aggression and abusive behaviors for online social games. *Computers in Human Behavior*, *53*, 517–526. https://doi.org/10.1016/j.chb.2014.10.025
2. Canale, N., Marino, C., Griffiths, M. D., Scacchi, L., Monaci, M. G., & Vieno, A. (2019). The association between problematic online gaming and perceived stress: The moderating effect of psychological resilience. *Journal of Behavioral Addictions*, *8*(1), 174–180. https://doi.org/10.1556/2006.8.2019.01
3. Ferretti, S., Roccetti, M., & Salomoni, P. (2008). Online Gaming. In *Encyclopedia of Multimedia* (pp. 680–685). Springer US. https://doi.org/10.1007/978-0-387-78414-4_166
4. Fox, J., & Tang, W. Y. (2017). Women's experiences with general and sexual harassment in online video games: Rumination, organizational responsiveness, withdrawal, and coping strategies. *New Media & Society*, *19*(8), 1290–1307. https://doi.org/10.1177/1461444816635778
5. González-Bueso, V., Santamaría, J., Oliveras, I., Fernández, D., Montero, E., Baño, M., Jiménez-Murcia, S., del Pino-Gutiérrez, A., & Ribas, J. (2020). Internet Gaming Disorder Clustering Based on Personality Traits in Adolescents, and Its Relation with Comorbid Psychological Symptoms. *International Journal of Environmental Research and Public Health*, *17*(5), 1516. https://doi.org/10.3390/ijerph17051516
6. Hellström, C., Nilsson, K. W., Leppert, J., & Åslund, C. (2015). Effects of adolescent online gaming time and motives on depressive, musculoskeletal, and psychosomatic symptoms. *Upsala Journal of Medical Sciences*, *120*(4), 263–275. https://doi.org/10.3109/03009734.2015.1049724
7. Hilvert-Bruce, Z., & Neill, J. T. (2020). I'm just trolling: The role of normative beliefs in aggressive behaviour in online gaming. *Computers in Human Behavior*, *102*, 303–311. https://doi.org/10.1016/j.chb.2019.09.003
8. Huang, J., Zhong, Z., Zhang, H., & Li, L. (2021). Cyberbullying in Social Media and Online Games among Chinese College Students and Its Associated Factors. *International Journal of Environmental Research and Public Health*, *18*(9), 4819. https://doi.org/10.3390/ijerph18094819
9. Kaye, L. K., & Pennington, C. R. (2016). "Girls can't play": The effects of stereotype threat on females' gaming performance. *Computers in Human Behavior*, *59*, 202–209. https://doi.org/10.1016/j.chb.2016.02.020
10. Krejcie, R. V., & Morgan, D. W. (1970). Determining Sample Size for Research Activities. Educational and Psychological Measurement. Small-Sample Techniques. *The NEA Research Bulletin*, *38*.
11. Lemmens, J. S., Valkenburg, P. M., & Peter, J. (2011). Psychosocial causes and consequences of pathological gaming. *Computers in Human Behavior*, *27*(1), 144–152. https://doi.org/10.1016/j.chb.2010.07.015
12. Lopez-Fernandez, O., Williams, A. J., Griffiths, M. D., & Kuss, D. J. (2019). Female Gaming, Gaming Addiction, and the Role of Women Within Gaming Culture: A Narrative Literature Review. *Frontiers in Psychiatry*, *10*. https://doi.org/10.3389/fpsyt.2019.00454
13. McCaffrey, M. (2019). The macro problem of microtransactions: The self-regulatory challenges of video game loot boxes. *Business Horizons*, *62*(4), 483–495. https://doi.org/10.1016/j.bushor.2019.03.001
14. McLean, L., & Griffiths, M. D. (2019). Female Gamers' Experience of Online Harassment and Social Support in Online Gaming: A Qualitative Study. *International Journal of Mental Health and Addiction*, *17*(4), 970–994. https://doi.org/10.1007/s11469-018-9962-0

15. Melodia, F., Canale, N., & Griffiths, M. D. (2022). The Role of Avoidance Coping and Escape Motives in Problematic Online Gaming: A Systematic Literature Review. *International Journal of Mental Health and Addiction*, *20*(2), 996–1022. https://doi.org/10.1007/s11469-020-00422-w

16. Müller, K. W., Janikian, M., Dreier, M., Wölfling, K., Beutel, M. E., Tzavara, C., Richardson, C., & Tsitsika, A. (2015). Regular gaming behavior and internet gaming disorder in European adolescents: results from a cross-national representative survey of prevalence, predictors, and psychopathological correlates. *European Child & Adolescent Psychiatry*, *24*(5), 565–574. https://doi.org/10.1007/s00787-014-0611-2

17. Neely, E. L. (2021). Come for the Game, Stay for the Cash Grab: The Ethics of Loot Boxes, Microtransactions, and Freemium Games. *Games and Culture*, *16*(2), 228–247. https://doi.org/10.1177/1555412019887658

18. Nwanosike, C. L., Ujoatuonu, I. V. N., Kanu, G. C., Ike, O. O., & Okeke, T. J. (2022). Social Bullying Among Undergraduates: The Roles of Internet Gaming Disorder, Risk-Taking Behavior, and Internet Addiction. *Frontiers in Psychology*, *13*. https://doi.org/10.3389/fpsyg.2022.830794

19. Pontes, H. M. (2017). Investigating the differential effects of social networking site addiction and Internet gaming disorder on psychological health. *Journal of Behavioral Addictions*, *6*(4), 601–610. https://doi.org/10.1556/2006.6.2017.075

20. Prasetyaningtyas, S. W., & Prayogo, A. (2021). The Effect of Cyberbullying in Multi-Player Online Gaming Environments: Gamer Perceptions. *2021 International Conference on Informatics, Multimedia, Cyber and Information System (ICIMCIS*, 244–249. https://doi.org/10.1109/ICIMCIS53775.2021.9699130

21. Rho, M., Lee, H., Lee, T.-H., Cho, H., Jung, D., Kim, D.-J., & Choi, I. (2017). Risk Factors for Internet Gaming Disorder: Psychological Factors and Internet Gaming Characteristics. *International Journal of Environmental Research and Public Health*, *15*(1), 40. https://doi.org/10.3390/ijerph15010040

22. Saarinen, T. (2017). *Toxic behavior in online games*.

23. Statista Research Department. (2024). *Online Games - Worldwide*. Statista.

24. Wang, X., Abdelhamid, M., & Sanders, G. L. (2021). Exploring the effects of psychological ownership, gaming motivations, and primary/secondary control on online game addiction. *Decision Support Systems*, *144*, 113512. https://doi.org/10.1016/j.dss.2021.113512

25. Xiang, G.-X., Zhang, Y.-H., Gan, X., Qin, K.-N., Zhou, Y.-N., Li, M., & Jin, X. (2022). Cyberbullying and internet gaming disorder in Chinese youth: The role of positive youth development attributes. *Frontiers in Public Health*, *10*. https://doi.org/10.3389/fpubh.2022.1017123

26. Yıldırım, N. (2022). The Bullying Game: Sexism Based Toxic Language Analysis on Online Games Chat Logs by Text Mining. *Journal of International Women's Studies*, *24*(3).

27. Zendle, D., Meyer, R., & Ballou, N. (2020). The changing face of desktop video game monetisation: An exploration of exposure to loot boxes, pay to win, and cosmetic microtransactions in the most-played Steam games of 2010-2019. *PLOS ONE*, *15*(5), e0232780. https://doi.org/10.1371/journal.pone.0232780

28. Zhao, H., Li, X., Zhou, J., Nie, Q., & Zhou, J. (2020). The relationship between bullying victimization and online game addiction among Chinese early adolescents: The potential role of meaning in life and gender differences. *Children and Youth Services Review*, *116*, 105261. https://doi.org/10.1016/j.childyouth.2020.105261