Research Article

The Impact of Digital Gaming Experience on the Self-Concept of Students of Delhi NCR

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Abstract

Children start to comprehend the universe at birth and eventually come to realize their own existence. They gradually establish their self-concept as they engage with their environment and start to identify who they are. Technological advancements have led to a rapid increase in the popularity of playing games on digital devices that offer a virtual space for users to interact through virtual avatars. Digital games have now largely taken the place of traditional toys in children's lives. The gaming metaverse is gaining popularity as it is revolutionizing the cyberspace of gaming into an interactive and interesting 3D platform by providing immersive environments. This quantitative study aims to comprehend how students' gaming experiences while engaging in virtual gaming platforms affect their self-concept, employing Robson's Self-Concept Scale (1989) and the Gaming Experience Questionnaire (IJsselsteijn et al., 2013). The sample comprises students from Delhi NCR. The statistical tools used are mean, standard deviation, t-test, and Pearson's correlation. The study elicits that female participants not only harbor a more positive self-concept but also demonstrate an enhanced involvement in gaming activities compared to their male counterparts. Similarly, age group distinctions manifest in self-concept and gaming experiences. The findings also illustrate that positive gaming encounters correlate with elevated self-concept, accentuating the intricate interplay between digital gaming experiences and self-concept formation.

Keywords gaming experience, metaverse, digital games, self-concept

Introduction

The employment of new and existing instruments in education is a blistering topic among academics and institutes of learning. A game is a form of play in which players adhere to set rules. The use of games to help teaching and learning is known as educational gaming. The learning experience for students can be improved and additional skills, such as following rules, adapting, problem-solving, interaction, critical thinking, creativity, teamwork, and good sportsmanship can be taught by using games as a supplement to traditional teaching methods. Learning shouldn't be boring and shouldn't only be rote memory exercises where pupils memorise information or study for tests. To raise student achievement, teachers can benefit from the vitality and creative thinking that technology-enhanced learning offers (Houghton et al., 2013).

In educational institutions, schools, and homes, a wide variety of educational games are being used. The primary

goal of using games in the classroom is to help students develop their critical thinking abilities while teaching a particular subject by encouraging them to think creatively while adhering to the rules. In recent years, digital games have proliferated in children's and adolescents' lives. Children learn informal digital literacy skills through play, and their unstructured encounters with technology may be changing how they learn and generate knowledge. These games also foster the type of learning that is distinctive to the culture of the information society, and this learning is expected to have long-term effects. Games can be used to teach a certain subject, but they can also have an impact on the learners. The purpose of introducing a gaming element in the classroom is to raise student motivation and engagement, improve visual skills, enhance peer interaction and collaboration, and give students the opportunity to apply game principles to real-world situations (Zirawaga et al.,2017).

Games like chess can promote reasoning, logic, and other qualities that are desired in education, but they are not characterised as educational games because they do not deliver content or communicate curriculum material (Yue & Zin, 2009). We refer to games as educational games if they contain curricular content or other instructional resources (Michel, 2016).

Children start to comprehend the universe at birth and eventually come to realize their own existence. They gradually establish their self-concept as they engage with their environment and start to identify who they are. Playing games on a computer or other digital device has become a daily need of children due to rapid technological innovation. Various electronic devices are used for playing games, the most used is a smartphone. Children are increasingly handling electronic devices at younger ages. Digital games, which have largely taken the place of traditional toys in children's life, are replacing more traditional toys on a regular basis.

The pace at which the world is moving today was unprecedented in the past. Children's play has evolved significantly over the past several decades because of the entry of electronic and video games into their world of pretend play. Digital natives, also known as net citizens (netizens), are members of the generation that was born in the twenty-first century. They internalise and interpret technology in daily life as if there were no such thing as living without it. In addition to growing up with computers and other technological advancements, the G-generation also experienced the rise of digital gaming. Digital gaming is a focus for the G generation (Zicherman & Linder, 2010). Children from the G generation spend a lot of time playing digital games, which helps them develop as players because the G generation is one of the biggest gamers (McGonigal, 2011). Electronic games' availability on smart phones and electronic touch screen tablets during the past ten years has made this transformation even more noticeable. Additionally, most of these games are available for free or a minimal fee for download. These days, kids can enjoy playing these games (of many genres, including action, adventure, sport, and strategy, etc.) anytime, anywhere.

The latest and the most trending innovation in the gaming environment is of the metaverse gaming world. The growth of cutting-edge technology like blockchain, real-time rendering technologies, digital twins, artificial intelligence, and 6G communications has aided in the spread of the metaverse (Zhong et al.,2017). The concept of the metaverse, a stereoscopic virtual universe that exists side by side with the real world, was

first introduced in the science fiction named Snow Crash (Joshua, 2017). The metaverse is viewed as a fresh wave of technological innovation that offers a digital environment for avatar-based communication. The players can enter the gaming world in the form of their virtual avatars and change characteristics of avatars, collect money, defeat opponents, interact with them and do activities as they desire through this mode of gaming structure. The current study collected data from the participants who engaged themselves in such kind of an immersive gaming environment.

The impact of electronic games (video games or computer touch screen tablet games) on player behaviour have been studied, with varying degrees of success. On one hand, certain studies have recorded negative impacts like increased aggression and several medical and psychosocial repercussions, while on the other hand, favourable effects like enhanced hand-eye coordination, reduced reaction times, and raised self-esteem have also been observed (Griffiths, 2002). Electronic games that are considered passive entertainment have no relationship to children's happiness or good self-concept, but those that are considered active entertainment have connections to happiness and positive self-concept in children (Holder, Coleman & Sehn, 2009).

Self-concept is the way a person views himself or herself as a physical, social, spiritual, or moral being (Gecas, 1982). Self-concept and self-esteem are two different but related concepts that are frequently used interchangeably. Self-concept is best exemplified by a profile of self-perceptions across domains and refers to a student's perceptions of competency or sufficiency in academic and nonacademic (such as social, behavioural, and athletic) domains. A student's entire assessment of who they are, including feelings of contentment and happiness in general, is called self-esteem (Harter, 1999). By putting self-concept-enhancing techniques into place, schools are more likely to encourage kids' good self-esteem (Manning, 2007). People's experiences with online gaming have an impact on their self-concept. If people experience joy and happiness, especially when playing adventure and action games, they typically have a positive self-concept (Przybylski, Weinstein, Murayama, Lynch, & Ryan, 2012). To increase learners' self-confidence, games are essential. Games are beneficial as teaching aids because they enliven typically dry and tedious teaching strategies (Boyle, 2011). Studies also show that by allowing the child to become more technologically adept and self-directed, educational computer programmes have a positive impact on learning and sense of self-worth (Wartella & Jennings, 2000). Overall, playing electronic games proficiently and mastering those yields better results than trying to complete them or advance from one level to another (Ryan, Rigby, & Przybylski, 2006). It is clear from Durkina and Barberb's (2002) study with university students that playing computer games helps students develop positive self-concept, particularly about skills related to computer technology. Students who played computer games scored better on self-concept reports than those who did not play. Additionally, those who engage with others via computers and social media typically have a positive self-concept (Sponcil & Gitimu, 2013).

Compared to kids who don't play electronic games, those who play them exhibit a better predisposition toward academic success (Yee, 2006). This is a significant finding because achievement and self-concept are strongly and favourably correlated (Marsh & Craven,

2006). As a result, it is advised to enhance students' self-concept as a non-cognitive intervention to increase academic achievement (Parker, Marsh, Ciarrochi, Marshall, & Abduljabbar, 2014). People who enjoy playing video games have a higher sense of self-concept and are more motivated (Przybylski et al., 2012). Self-efficacy is linked to self-concept because those who have higher self-esteem are typically better at problem-solving and critical thinking (Kim & Choi, 2014). Studies have revealed a link between physical play and a physical self-concept (Babic et al., 2014). For kids to learn something or benefit from the games they play, interaction with others (Kory & Breazeal, 2014), particularly parent-child interaction (Radesky, Schumacher & Zuckerman, 2015), as well as interactive feedback from their parents, teachers, or siblings is necessary (Yannier, Koedinger & Hudson, 2015).

The World Health Organization (WHO) media brief 2022 states that children who have crossed or are about to cross puberty can be divided into two general categories: older adolescents and young adults, who fall within the age ranges of 15 to 19 and 20 to 24 years, respectively. This is the time when the personality of an individual starts developing, and they start forming their self-concept. This self-concept is a key component of their personality because it determines their chances of success in the future. Given the extreme popularity of video games among older adolescents and young adults, it is imperative to investigate the benefits of playing online games during these developmental stages (C. Adachi & Willoughby, 2015).

Numerous studies have been under taken regarding the effect of playing games on students' self-concepts, however it is quite uncommon to find studies that specifically delineate into the impact of immersive gaming experiences in a virtual world on students' self-concepts. Gaming experience refers to what the players encounter as a result of engaging with a game. Common metrics used to analyze these experiences include flow, immersion, competence, challenge, tension, and negative/positive affect (Bernhaupt, IJsselsteijn, Mueller, Tscheligi & Wixon, 2008).

Overall, researchers agree that games have some influence on how people behave. However, there is a dearth of research on the direct impact of metaverse gaming experiences on students' self-concept. Also, the association among older adolescents and young adults on the self-concept has not been studied in-depth over a long period of time, so it represents an interesting new field of research. For this reason, the objective of this study was to examine the impact of gaming experiences on students' self-concept.

In light of the aforementioned context, the researcher has investigated how gaming experiences are affecting older adolescents and younger students' self-concept. The current study has been guided by the following three research questions.

Research Questions

1. Does gaming experience affect the self-concept of students?
2. Whether students of different age groups and gender exhibit different self-concept when exposed to gaming experiences?
3. Does there exist any relationship between the self-concept and gaming experience of students?

To answer the above three research questions, the following three objectives have been achieved.

Objectives

1. To study the impact of gender and age on the self-concept of students.

2. To study the impact of gender and age on the gaming experience of students.
3. To examine the relationship between the self-concept and gaming experience of students.

The following hypothesis are developed and put to the test with the intention of achieving the objectives.

Hypothesis

H_{01}: Gender does not have significant impact on the self-concept of students

H_{02}: Age does not have any significant impact on the self-concept of students

H_{03}: Gender does not have significant impact on the gaming experience of students

H_{04}: Age does not have any significant impact on the gaming experience of students

H_{05}: There exists no significant relationship between self-concept and gaming experience of students

Methodology

The study was carried out by the researcher using the descriptive survey method. The population of the study comprised of older adolescent (15 to 19 years) and young adult (20 to 24 years) students of NCR of India.

Utilizing a random sampling technique, the sample for the study was selected. 65 students, 27 males and 38 females who are enrolled in English-medium schools across both public and private high schools and colleges made up the study's final sample. The study was conducted on 29 older adolescents and 36 young adults.

Tools Used

To assess the gaming experience, the Game Experience Questionnaire (GEQ) (IJsselsteijn et al., 2013), a self-report measure that aims to comprehensively and reliably characterize the multifaceted experience of playing digital games was used. The self-concept of students considered in the present study was examined using the Self-Concept Questionnaire (SCQ) designed and standardized by Robson (1989).

Game Experience Questionnaire (GEQ)

The GEQ is popular and widely used in previous studies with different game genres. In Parts 1 and 2, the players' emotions and thoughts are examined while they are immersed in playing the game; in Part 3, the post-game module, the players' feelings are evaluated after they have finished the game. A modular framework is used in the development of the Game Experience Questionnaire, and it consists of:

1. Core Questionnaire (GEQ): This module examines seven facets of gamers' experiences, including Immersion, Flow, Competence, Positive and Negative Affect, Tension, and Challenge.
2. Social Presence Module (SPGQ): This module explores players' interactions with co-players, both real and virtual, examining psychological and behavioral engagement.
3. Post-Game Questionnaire (PGQ): This module investigates players' experiences after a gaming session, encompassing positive and negative aspects, tiredness, and the transition back to reality.

The three modules should be given out in the sequence listed above, just after the gaming session has ended. Component scores are calculated using the average value of its items.

Self-Concept Questionnaire (SCQ)

The research investigation made use of the Robson-designed and standardized Self-Concept Questionnaire (SCQ) developed in 1989 by Robson. This scale

measures one's perception of oneself (Robson, 1989). This scale, comprising thirty items such as "I am in charge of my life" and "I feel emotionally mature," measures one's self-perception. Each item is rated on an eight-point scale, ranging from total agreement (0) to total dissent (7). The scale has demonstrated reliability (Cronbach's alpha of .89) and clinical validity (i.e., clinical validity of .70) (Ata Ghaderi, 2005). Higher scores indicate a positive self-image and strong self-esteem, while lower scores suggest rejection and a negative self-image.

Collection of Data

With the help of Google Forms, the data was gathered from the respondents. They were informed beforehand about the study, and information was voluntarily provided by them. By interacting using Google Forms, the researcher disseminated two questionnaires: the Self-Concept Questionnaire and the Gaming Experience Questionnaire.

Statistical Measures

The software system SPSS 16.0 was used to examine the data. To examine the gathered information, a descriptive statistical analysis was performed on the scores for Self-Concept and Gaming Experience. The statistical tools used were mean, standard deviation, t-test, and Pearson's correlation. The total scores of both the variables under consideration were found to have estimated Skewness and Kurtosis values that ranged from -1.96 to +1.96 (Joreskog, 2001), which tested the assumption of a normal distribution. The information was therefore seen as being normally dispersed. Table 1 provides the descriptive data for Self-Concept and Gaming Experience. The parametric statistical test for Correlation Analysis was used to determine the association between Self-Concept, Gaming Experience Core Module, Gaming Experience Social Presence Module, and Gaming Experience Post Game Module after confirming that the assumptions of normality had been met.

Analysis and Discussion

The t-test value for each hypothesis analysis has been computed at a significance level of 5 per cent to assess the statistical significance.

Table1 depicts the descriptive statistics for the levels of self-concept and gaming experience.

The sample under study belonging to different gender and age groups exhibit a difference in their self-concept. The gaming experience does not have a significant difference on either of the demographic variables, i.e., gender and age.

Table-1: Descriptive Statistics for Self-Concept and Gaming Experience

Variable	Min	Max	Range	Size	Mean	S.D.	Variance	Skewness	Kurtosis
Self-Concept	65	191	126	65	121.523	31.108	967.722	0.4099	-0.4053
Gaming Experience	57	221	164	65	134.892	36.873	1359.628	0.3684	-0.2467

Following is a discussion of the study's findings according to each hypothesis.

H_{01}: Gender does not have significant impact on the self-concept of students

Based on the results of the self-concept, all male and female students were identified, and the data collected through questionnaires is tabulated, which yielded the following result:

Table-2: Mean scores and standard deviation of self-concept with respect to gender

GENDER	NUMBER OF STUDENTS	AVERAGE (MEAN)	STANDARD DEVIATION
MALE	27	107.6667	29.0887
FEMALE	38	131.3684	28.9766

An analysis of the Table 2 indicates that out of the entire sample of 65 students, there are 27 male students and 38 female students. The results show that females have an average score of 131.3684 (SD = 28.9766) which is higher than that of males who have an average score of 107.6667 (SD = 29.0887). Males differ significantly from the females when a comparison is made amongst them on the variable of self-concept wherein females standout by a difference in average of 23.7018. The computed t test value is 3.24 with 63 as the degree of freedom. The tabulated value at the same level is 2 which is less than the computed value. This shows that there is a significant difference in values and the null hypothesis stands rejected.

H_{02}: Age does not have any significant impact on the self-concept of students

Based on the results of the self-concept, the students belonging to the category of older adolescent (15-19 years) and young adult (20-24 years) students were identified and their data tabulated, which yielded the following result:

Table-3: Mean scores and standard deviation of self-concept with respect to age

AGE	NUMBER OF STUDENTS	AVERAGE (MEAN)	STANDARD DEVIATION
Older Adolescents (15-19 yrs.)	29	104.3793	25.1288
Young Adults (20-24 yrs.)	36	135.3333	28.7173

An analysis of the Table 3 indicates that out of the entire sample of 65 students, there are 29 older adolescent and 36 young adult students. The results show that older adolescents have an average score of 104.3793 (SD = 25.1288) which is lower than that of young adults who have an average score of 135.3333 (SD = 28.7173). Young adults differ significantly from the older adolescents when a comparison is made amongst them on the variable of self-concept wherein young adults are better than older adolescents by an average difference of 30.9540. The computed t test value is 4.56 with 63 as the degree of freedom. The tabulated value at the same level is 2 which is less than the computed value. This shows that there is a significant difference in values and the null hypothesis stands rejected.

H_{03}: Gender does not have significant impact on the gaming experience of students

To test the above hypothesis, the gaming experience data of male and female students was collected using questionnaire consisting of three modules. The results are tabulated below:

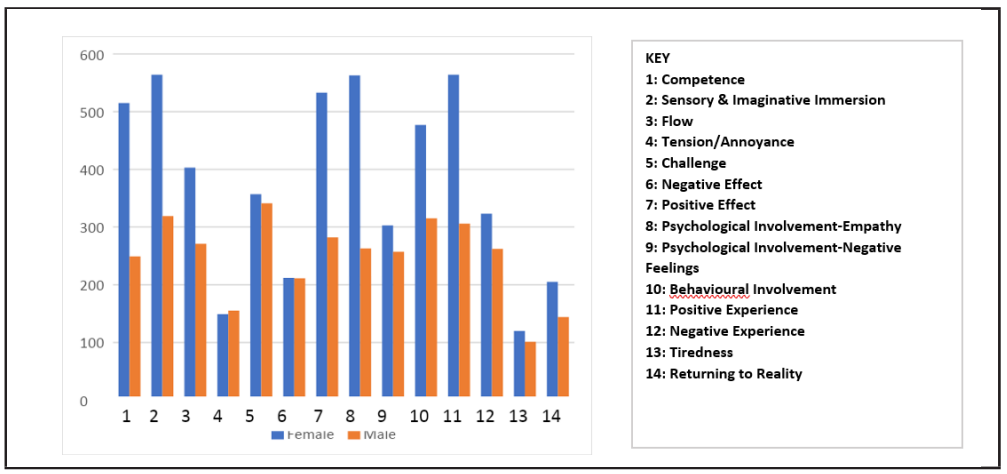
Table-4: Mean scores and standard deviation of gaming experience (gaming module wise) with respect to gender

GAMING EXPERIENCE	GENDER	NUMBER	AVERAGE (MEAN)	STANDARD DEVIATION
PART-I CORE MODULE	MALE	27	67.7037	13.1816
	FEMALE	38	71.921	19.7119
PART-II SOCIAL PRESENCE MODULE	MALE	27	30.9259	11.4654
	FEMALE	38	35.3421	14.1407
PART-III POST GAME MODULE	MALE	27	30.1111	6.0468
	FEMALE	38	31.8947	12.5822
TOTAL	MALE	27	128.8148	26.7439
	FEMALE	38	139.2105	42.4628

The results in Table 4 show that male students have a total average score of 128.8148 (SD = 26.7439) which is lower than that of female students who have a total average score of 139.2105 (SD = 42.4628). Female students differ from the male students by an average difference of 10.3957 when a comparison is made amongst them on the variable of gaming experience. A mean comparison test (t-test) was conducted to determine whether the gender variable influenced the gaming experience. The computed t test value is 1.1224 with 63 as the degree of freedom. The tabulated value at the same level is 2 which is more than the computed value. This shows that there is no significant difference in values and thus the null hypothesis is accepted.

The bar graph below shows the item analysis of gaming experience of males and females. As discussed above the gaming experience questionnaire consists of three modules. The first seven key components are a part of the core module. The next three components are a part of the social presence module and the last four are a part of the post gaming module.

Figure-1: Gender-wise comparison of the gaming experience of each item



The graph shows that, except from the tension/annoyance and negative effect components, results with females are generally better than those with males. This demonstrates that while men are more tenacious and irritable than women, playing games can help them relax more. Several studies have been conducted to elicit the hidden components as to why the stress level among males is relatively higher among males in comparison to females. After the players have stopped playing the game, majority of them suffer from the negative experiences of gaming.

H_{04}: Age does not have any significant impact on the gaming experience of students

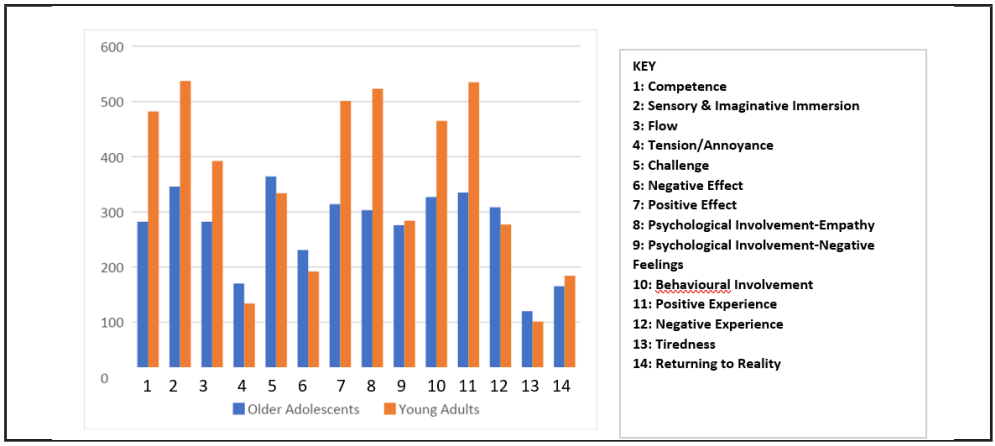
The above hypothesis is tested by categorizing the students into two categories. The students in the age group of 15-19 years and 20-24 years, the older adolescents, and the young adults respectively. The results are tabulated below:

Table-5: Mean scores and standard deviation of gaming experience (gaming module wise) with respect to age

GAMING EXPERIENCE	AGE	NUMBER	AVERAGE (MEAN)	STANDARD DEVIATION
PART-I CORE MODULE	15-19	29	68.5862	14.5835
	20-24	36	71.4444	19.3383
PART-II SOCIAL PRESENCE MODULE	15-19	29	31.2414	14.6206
	20-24	36	35.3333	11.7959
PART-III POST GAME MODULE	15-19	29	32	9.9319
	20-24	36	30.4722	10.7690
TOTAL	15-19	29	131.9655	34.3610
	20-24	36	137.25	39.1001

The results in Table 5 indicate that older adolescents have a total average score of 131.9655 (SD = 34.3610) which is slightly lower than that of young adults who have a total average score of 137.25 (SD = 39.1001). Older adolescent students differ from the young adult students by an average difference of 5.2845 when a comparison is made amongst them on the variable of gaming experience. A mean comparison test (t-test) was conducted to determine whether the gender variable influenced the gaming experience. The computed t test value is 1.1224 with 63 as the degree of freedom. The tabulated value at the same level is 2 which is more than the computed value. This shows that there is no significant difference in values and thus the null hypothesis is accepted. The item analysis of male and female gamers is displayed in the graph below.

Figure-2: Age wise comparison of gaming experience of each item



The graph shows that the young adults outshine the older adolescents in majority of the components of gaming experience questionnaire barring a few. The older adolescents show higher scores with item components tension/ annoyance, challenge, and negative effect of the core game module as well as the two components of the post-game module (negative experience and tiredness). Both the core and post-game modules frequently result in negative effect or experience, which causes players to either feel bored or exhausted, think about other things, or feel regret and wish they had done something more beneficial other than gaming immersion. The items that make up the components showing the variations in the gaming experiences of older adolescents and young adults can be used to elicit these player thoughts.

H_{05}: There exists no significant relation between self-concept and gaming experience of students

Table 6 depicts the findings from the Pearson correlation coefficient technique to determine the existence of relationship between gaming experience core module, gaming experience social presence module, gaming experience post game module and self-concept.

Table-6: Correlation Matrix between gaming experience and self-concept of students

	Gaming Experience CORE Module	Gaming Experience SOCIAL PRESENCE Module	Gaming Experience POST GAME Module	SELF-CONCEPT
Gaming Experience CORE Module	1			
Gaming Experience SOCIAL PRESENCE Module	0.7637	1		
Gaming Experience POST GAME Module	0.6995	0.6695	1	
SELF-CONCEPT	0.1063	0.0452	-0.0704	1

It is evident that there is a strong positive correlation between gaming experience core module and gaming experience social presence module (r = 0.7637). A moderate positive correlation is found between gaming experience core module and gaming experience post game module (r = 0.6995). Whereas there is a very weak positive correlation between gaming experience core module and self-concept (r = 0.1063). A moderate positive correlation between gaming experience social presence module and gaming experience post game module (r = 0.6695). The social presence module of gaming experience and self-concept have a weak positive correlation (r = 0.0452). On the other hand, there is a weak negative correlation between gaming experience post game module and self-concept (r = -0.0704). These figures of correlation depict that all the relationships show a positive correlation except the gaming experience post game module and self-concept. This shows that there is a significant difference in values and thus the null hypothesis is rejected. The results reveal that a good gaming experience leads to a high self-concept amongst students, the only exception being with the gaming experience post game module wherein the gaming post game experience is good when the self-concept of students is low which indicates that students whose self-concept is low is indulging in playing more games to boost up their self-confidence. The students with low self-concept are finding these game experiences extremely useful.

Analysis and Interpretation of Results

The results extracted from Tables 2-6 reveal noteworthy patterns across various dimensions under investigation. Firstly, the mean self-concept of females surpasses that of males, indicating a gender-based discrepancy in self-perception. This disparity is bolstered by a statistically significant difference in the self-concept of male and female students. Our results are consistent with other studies (Cross & Madson,1997; Maddux & Brewer, 2005). The data also illustrates that older adolescents exhibit a higher mean self-concept than their young adult counterparts, and this contrast between the two age groups is statistically significant. Transitioning to gaming experiences, the absence of statistically significant differences in gaming experience, both between genders and across age groups, aligns with Bunz et al.'s observations (Bunz et al., 2020). While investigations, such as those conducted by Apriani et al. (2022), Hou (2018), and Khan et al. (2017), have reached the consensus that female students exhibit variations in both perception and gaming performance. These results emphasize that further research is imperative to elucidate the reasons behind the observed divergence, necessitating a more in-depth exploration of methodological nuances, contextual variations, and the evolving nature of educational practices to enhance the understanding of gender disparities in digital gaming experiences. This collective insight contributes significantly to advancing our comprehension of the intricate relationships between self-concept, gaming experiences, and demographic variables within the studied population.

Conclusion

The findings of this study demonstrated the relationship between metaverse gaming experience and self-concept. The study's findings show that students who have positive gaming experiences tend to have higher self-concepts leading to a positive self-image and high self-esteem, in contrast to the post-game module, which shows positive gaming experiences even when students have low self-concepts bolstering a negative

self-image. This suggests that students with lower self-concept might turn to gaming to enhance their mood or gain a sense of accomplishment within the virtual world. Even though their self-concept may not improve significantly after the gaming experience, as indicated by the weak negative correlation, the positive aspects of gaming may still serve as a source of enjoyment or temporary confidence for these individuals. This insight could be valuable for understanding the role of gaming in the lives of students with varying levels of self-concept. The findings of this study are consistent with those of Przybylski et al. (2012), who discovered that individuals who played video games exhibited better self-concept. Our results corroborate with those of McPhee et al. (2013) and Bahatheg (2013), who discovered that playing video games improved one's self-concept. Electronic and tablet games are neither essentially good nor negative; rather, the effects they have depend on how they are played (Eichenbaum et al., 2014). It is suggested to conduct more research studies with a larger sample size on the impact of gaming experiences on children's development. These studies should include children of various ages, economic and social backgrounds, and intellectual abilities, as well as games from various genres. This is especially important now that kids all over the world use gaming devices extensively. The act of gaming stirs up powerful emotions. However, little is known about the gameplay circumstances that cause a variety of emotions to arise. More research can be done to determine which game scenarios cause unpleasant feelings.

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