Children as Audience & Consumer of Interactive Mobile Games: Decoding the Parent's Perspective

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Abstract

A study examining parental perspectives on their children's use of mobile games for both entertainment and education revealed multifaceted outcomes. The investigation focused on three age groups: toddlers (1-3 years), pre-schoolers (3-5 years), and school-age children (5-17 years). Analyzing 266 responses through PCA, Multiple linear regression, and One-way ANOVA, the research found that parents recognize a strong entertainment value in these games but also acknowledge their educational benefits. However, perceptions of the educational utility vary with the child's developmental stage.

The most pressing concern highlighted by parents is the predominance of gaming in children's daily routines, with a mean score indicating it as a significant challenge. From an analytical standpoint, when considering educational purposes as an outcome variable, cognitive development surprisingly showed a negative correlation while other factors positively influenced this aspect; this model accounted for 62.9% of variance observed. In contrast, only 38.8% of variance was explained for entertainment purposes where academic performance did not show any notable effect.

In essence, while mobile games are seen to offer both fun and learning opportunities for children across different ages, there is caution regarding their overuse and varying impacts on cognitive growth depending on age-related expectations from such interactive platforms.

Keywords: Children; Entertainment; Educational; Interactive; Mobile Games

1.   Introduction

Child development is one of the critical phases in the lives of parents. Their vulnerability leads to attainment of many beneficial as well as affective sets of traits. The parents at this level are experimenting with the best options for their children and look for a balance between entertainment and educational features. This would allow the children to develop the right set of understanding about various things. In the present times, the parents are technologically advanced and thereby look for solutions related to it. Mobile phones are one of the most innovative and disruptive products launched in the market in the recent past. With an affordable approach in its provisions, mobile phones in the present times are endowed with several different applications. Such applications include several entertainment and educational tools that can facilitate the learning and enjoyment values of individuals at different levels (Cheung & Ng, 2021; Santosa et al., 2022). It is one medium that is preferred by parents for their children in terms of deriving entertainment as well as education. However, one of the challenges found in terms of the use of such applications in mobile phones is that interactive games are addictive to children and cause a hindrance to their development (Rahayu et al., 2021). It has been

observed that children as early as in their toddler phase are exposed to mobile phones where they seek various content to keep them interested. This method although helps in engaging the children can sometimes generate a dependency on mobile phones. Several studies have talked about the use of mobile games among children but the preference to use them as an entertainment or educational tool is still an ongoing debate (Elsherbiny & H. Al Maamari, 2021; Jeong, 2022; Vega-Ramírez et al., 2020). The study here is interested in understanding the usage preferences of interactive mobile games among children either in terms of generating a learning experience or solely to serve their entertainment needs. According to (Laricchia, 2023), the number of children owning mobile phones went up from 11% in 2015 to 31% in 2021 and the age group owning these phones averaged 8 years only. Moreover, (Shah & Phadke, 2023) mentioned in their study that the phone usage time among children in the 3 to 4 years of age group is 3 hours or more. However, studies investigating the same in a childhood phase level are scarce and the study would include each of the stages of childhood to develop the perception based on every level. To dive into the area of interactive mobile games among children, the study will attempt to answer the following research questions –

RQ1: Which is the most preferred use of interactive mobile games among children – entertainment value provided or its use as an educational tool?

RQ2: Does the perspective of using interactive mobile games as an entertainment or educational tool vary over the stages of childhood?

RQ3: Are the cognitive development, social interactions, and academic performance levels of children a determinant of looking into interactive mobile games as an entertainment or educational tool?

An extensive review of the literature is conducted to understand the studies in the current body of knowledge and design the methodology to be followed in this course of study. The details are provided in the next section of the study.

2.   Review of Literature

Entertainment value of mobile games for children

The primary use for which the development of mobile games for children occurred has been for entertainment purposes. The entertainment value of mobile games for children range from a number of benefits pertaining to its optimum use, mostly enhancing interactivity (Zamri et al., 2020). However, over the period of time, its use has been optimised by including elements of learning for better adoption. It has been established that there are certain game based applications that are designed for child development and extend a positive impact on the overall well-being of a child (Yadav & Chakraborty, 2022). It finds its application in the video chatting apps which include storytelling and uttering vocabulary as the game proceeds into the next stage. There are several science and mathematics based games which foster skill development and problem solving abilities in the children (Göksu et al., 2020). The interactive mobile games designed today for children converge to the idea that it needs to be entertaining along with providing some sort of benefit to their developmental state of mind (Anthony et al., 2021; Gocheva et al., 2020). Its use as a medium of engagement and social interaction for children suffering from special abilities such as Attention Deficit Hyperactivity Disorder (ADHD) and autism can be highlighted in this regard (Doulou et al., 2022). Here, the use of such interactive based mobile games can serve to be more purposeful as compared to traditional methods of learning. Overall, the use of mobile games for children in terms of entertainment refers to using them for engagement and recreation.

Educational benefits of Interactive Mobile Games for children

The educational benefits of providing interactive mobile games to children have been investigated and established by the works of many researchers such as (Griffith et al., 2020; Papadakis et al., 2020; Papadakis & Kalogiannakis, 2020) They talked about exploring the educational values of mobile interactive games and how it helps to provide an advantage to the children in terms of their educational development. The use of mobile games for education have been an innovative way of engaging children with the virtual world. As it acts as a medium of learning, parents often do not hesitate in providing such games to the children (Hassan et al., 2022; Zamri et al., 2020). The learning experience through such games are devised in a dynamic and interesting way that instantly captures the attention of the children. The use of animation and other audio video medium makes its attractive (Papadakis & Kalogiannakis, 2017). Moreover, the engagement of the children in terms of answering quizzes, selecting options to move further or put up their innovative options on screen

make it more approachable (Ni & Yu, 2015). However, there are many shortcomings of such methods as well. These include the deviation from the traditional teaching methods making children develop their own way of understanding which can lead to them not having good academic performances (Genc, 2014; JOHANSSON & GÖTESTAM, 2004). It is worth noting that mobile games have devised special emotion based educational games that have been designed for autistic students to enhance their abilities (Heni & Hamam, 2016). The applications as seen from the discussion can sincerely help in formulating a learning base for the children and help them derive a good understanding of their learning abilities with the aid of such interesting tools. But it must be understood that the use of such tools needs to provide under supervision and for a definite period of time to avoid the negative consequences.

Parent's concern on consumption of Mobile Games by children

As parents, the use of mobile based games among children has raised many concerns. While the provision of such games to children has become inevitable, parents often try to regulate the type of games they offer their children. For example, (Brito & Dias, 2020) did their study to derive an understanding of how parents of children select apps. The study focused on how parents look for positive content online and look into the operating guidelines for providing the content. They often consider offline experiences as a measure for reference. They are drawn towards applications with educational points such as puzzles, quizzes, etc. Another concern that regulates the minds of the parents is about the lack of physical activities due to the involvement of the children in the mobile games (Faric et al., 2019; McMichael et al., 2020a, 2020b). (Lee & Gao, 2020) investigated the role of mobile-based applications on the physical activities and psychological levels of children. It is seen that while there are significant improvements in psychological beliefs, in case of physical activity driven tasks are limited. In order to achieve both psychological and physical benefits from such usage, the alignment of the learning goals in the selection of the apps to use is suggested. It can be regulated by parents in case of children who are of younger age group and accordingly form their habit of aligning mobile games with physical activities. The children and adolescents exposed to online games using mobile often fall prey to cyberbullying (Q. Li et al., 2021; Tintori et al., 2023). The concerns of being victimised especially in a multiplayer environment serves as an area of concern for the parents (Huang et al., 2019).

3.   Method

An appropriate research design is the need for any study conducted. The study here has designed a systematic plan of research methodology that has helped in generating an error-free and bias-free set of results. The study here is descriptive in nature and follows a quantitative method to arrive at the results.

Participants

The study here makes use of both primary and secondary sources of data. The secondary data gathered from journals, books, reports, and online websites have been used thoroughly in designing the survey instrument. The study involves understanding the role of mobile games as an educational or entertainment purpose among children. However, as different stages of childhood would be considered and data from the children themselves would not be feasible, the population of the study is being restricted to the parents of the children. Using purposive sampling, only those samples have been considered in the study who have children in the age group of 3 to 17 years and use interactive mobile games either for educational or entertainment purposes. A sample size of 266 is taken and the data collected are analyzed using appropriate statistical tools. The demographics of the participants are shown in the tables 1 & 2 below.

Table 1 - Frequencies of Gender

Gender	Counts	% of Total	Cumulative %
Female	188	70.7 %	70.7 %
Male	78	29.3 %	100.0 %

Table 2 - Frequencies of Age of Children You teach

Age of Children you teach	Counts	% of Total	Cumulative %
Preschool (3-5 Years)	79	29.7 %	29.7 %
School Age (5-17 years)	130	48.9 %	78.6 %
Toddler (1-3 years)	57	21.4 %	100.0 %

The children considered for the study include 70.7% female and 29.3% male. The children investigated in the study have been mainly classified into three groups based on the phases of childhood. The first category is that of toddlers who are in the age group of 1 to 3 years. These include 21.4% of the total responses. The next includes pre-schoolers falling in the age group of 3 to 5 years with 29.7%. Lastly, the next includes the children who are school-going and includes 5 to 17 years of age. As the age bracket in the third category is high, there are 48.9% of the children in this phase.

Data Sources and Procedures
The participants being investigated in the study here are informed about the cause of the study and consent has been taken before recording their data sources. The instrument design is a structured questionnaire in a 5-point Likert-type scale used to collect the primary set of data. The purpose of designing this questionnaire is to be able to quantify the responses and analyse them using statistical tools such as principal component analysis, multiple linear regression, and One-way ANOVA. The questionnaire is divided primarily into three sections-

Section 1 – Usage Patterns of the Children
The first scale includes a total of 10 items that are based on understanding whether these children are provided access to interactive mobile games for entertainment or educational purposes. The idea is to define the category towards which the use of interactive mobile games among the children are inclined. It uses questions that determine when the use of mobile phones are provided and exactly for what purpose it is being used. The items have been prepared by referring to the inputs provided by (Genc, 2014; Radesky et al., 2015).

Section 2 - Challenges
The next section of the questionnaire deals with the negative aspects of the challenges related to the use of mobile interactive games by children. Such uses are often termed as addiction and the same is investigated with the following five-item scale. It only points out the challenges that are observed in the children when they are deprived of using the interactive mobile games. Many studies have found the development of addiction when such games are not provided to the regular users. In order to understand how it works in terms of children, the five items are derived from the works of (JOHANSSON & GÖTESTAM, 2004; Lortie & Guitton, 2013) and modified according to the need of the study.

Section 3 – Behavioral Aspect of the Children
In the next set of items in the questionnaire there are a total of 15 items that include questions related to the behavior of the child according to the respondents. This is a crucial scale as it would investigate how the use of interactive mobile games affect the behaviour of the children in their day to day activities. The components that are expected to be resolved using this section of the questionnaire includes their cognitive aspect, the social interactions that they are involved in lastly, the academic performance. These three are crucial as it can help in shaping a child's overall development. The scale used is prepared by considering the works of (Chen et al., 2018; M. Li et al., 2022) and modifying to meet the requirements of the study here.

As the questionnaire items cover the items required to answer the research questions above, the detailed analysis with these datasets and its interpretation are provided in the next section.

4.   Results

The study has been conducted using the SPSS software and a total of 266 responses have been used for the final data analysis process. Firstly, the demographics of the children being investigated in the study are being analyzed. As these 266 responses are from the teachers, the demographics shown below are for that of the child they are answering the questionnaire for.

The questionnaire design includes an investigation of the questions in hand in three distinctive phases.

Table 3 - Descriptives - Usage pattern of your child for interactive mobile games

	N	Mean	Median	SD	Minimum	Maximum
My child plays interactive mobile games primarily for entertainment purposes	266	4.30	4.00	0.637	3	5
I find interactive mobile games to be a fun way to spend my free time	266	2.60	3.00	1.016	1	4
I believe that interactive mobile games have helped me learn new things	266	3.29	3.00	1.093	2	5
When playing mobile games, my ward's main focus is on the entertainment value rather than the educational content	266	4.30	4.00	0.637	3	5
I think interactive mobile games can be a useful tool for learning and education	266	2.89	3.00	1.041	1	5
I believe that mobile games with educational content are as enjoyable as purely entertaining games for my ward	266	2.80	3.00	0.743	2	4
I encourage my child to play educational mobile games to learn new things	266	3.03	3.00	1.205	1	5
I feel that the time spent playing interactive mobile games contributes positively to my ward's overall development	266	3.50	4.00	0.920	2	5
I believe that interactive mobile games strike a good balance between entertainment and education	266	2.90	3.00	0.825	2	4
I would recommend educational mobile games to my friends as a way to learn and have fun	266	3.01	3.00	0.905	1	4

The highest mean score of 4.30 indicates a strong inclination towards viewing online interactive games primarily as a source of entertainment rather than for educational purposes. This suggests that the participants are more likely to engage in gaming activities for recreational enjoyment rather than for learning or educational enrichment. The two items where the score of 4.30 is found both indicate the use of such games for entertainment purposes and even agreed to place it above educational fulfillment that such games can offer. On the other hand, the lowest score of 2.60 reflects a lower level of agreement among participants regarding the idea of considering these games as an enjoyable way of spending free time. This discrepancy in perception suggests that while some participants may find use of interactive mobile games enjoyable and engaging, its use as a preferred leisure activity is not that highly seen. This is a good sign for the children as spending their leisure time is not preferred using the mobile games but would rather involve other sources of activities. There is a difference in the usage levels observed and although this source acts as a tool of entertainment, its use in times of leisure is not highly preferred. This has opened an interesting area of discussion and further studies would continue it.

Based on the analysis above, the 10 items have been segregated into two levels i.e., preference for using interactive mobile games for education or entertainment purposes. The combined mean scores for the two categories are as follows-

Table 4 - Descriptives for two sections of Usage Patterns

	N	Mean	Median	SD	Minimum	Maximum
Education Purpose	266	3.26	3.50	0.464	2.50	3.75
Entertainment Purpose	266	3.73	3.67	0.462	3.00	4.67

With a 3.73 mean score, the agreement for the games being for entertainment purposes is more than the 3.26 mean score for education purposes. However, the mean score difference is not that high and both exhibit a high level of agreement for mobile interactive games serving both purposes. As discussed above, the entertainment purpose is mostly fulfilled among the children with the use of interactive mobile games. This shows that the preference of the children for using it as an entertainment source is higher than education purpose. As the difference is not that high, it can be stated that there is a chance of using interactive mobile games for education purpose over entertainment in the future. This can be further beneficial to establish the educational usage of such interactive games.

In this section, the second scale which is solely to understand the challenges related to the use of interactive mobile games among the children is discussed. Firstly, in table 5, the responses against each of the items are provided for understanding the perception of the respondents.

Table 5 - Descriptives - Challenges

	N	Mean	Median	SD	Minimum	Maximum
Do you feel your child is preoccupied with their gaming behavior?	266	2.18	2.00	0.990	1	4
Does your child feel more irritability, anxiety, or even sadness when you try to either reduce or stop their gaming activity?	266	2.87	2.00	1.461	1	5
Do you think gaming has become the dominant activity in your child's daily life?	266	3.28	3.00	1.419	1	5

Table 5 - Descriptives - Challenges

	N	Mean	Median	SD	Minimum	Maximum
Do you systematically fail when trying to control or cease your child's gaming activity?	266	2.97	3.00	1.625	1	5
Has your child lost interest in previous hobbies and other entertainment activities as a result of their engagement with the game?	266	2.87	2.00	1.320	1	5

The mean scores show a highest value of 3.28 for the games becoming a dominant activity in the lives of the children. The lowest score is 2.18 for the agreement of the child's preoccupied behavior with the gaming behavior. There are items scoring 2.87 and 2.97 where the agreement is that the child has lost interest in other entertaining hobbies and feels anxious or unstable when the mobile interactive games are taken away from them. It also shows that parents agree to a sufficient extent that they fail when they try to control the level of use of interactive mobile games in their children. Overall the mean score for challenges stands at 3.06 which is above the mid-level of the 5 Point scale. This interprets the presence of some level of challenges in the use of mobile interactive games among the children according to the respondents. The above mentioned challenges are quite concerning and as the mean scores are mostly more than the halfway scoring of 2.5 in the scale of 5, it shows that the problem exists and parents do face such challenges in restricting their children with the use of interactive mobile games.

The mean score as shown in table 6 below stands at 3.06 which is very high and depicts the presence of these challenges among the parents of the children using interactive mobile games.

Table 6 – Mean Score for Challenges Scale

	N	Mean	Median	SD	Minimum	Maximum
Challenges	266	3.06	2.60	1.377	1.40	5.00

As there is a significant amount of challenges observed among the parents in regulating the use of interactive mobile games, the behavioural influence that these games are causing are discussed by using the third scale in the study.

The next set of items in the questionnaire includes a total of 15 items that include questions related to the behavior of the child according to the respondents. Before understanding its impact level on the children, the use of PCA is done to identify the underlying factors in the scale and terming them with respect to the variables aimed for. To extract the underlying factors from the 15 items, PCA using varimax rotation is conducted. The varimax rotation allows one to maximize the factor loadings and as per (Hair et al., 2006) based on the sample size of more than 200, factor loadings of more than 0.4 are considered acceptable.

The sampling adequacy tests conducted using KMO and Bartlett's test show an overall KMO of 0.896 which is more than the acceptable value of 0.7. The p-value in Bartlett's test is less than 0.05 and meets the sampling adequacy parameters of the below items. This shows that the sample size collected for interpreting the results using this scale is adequate and can be proceeded to attain the results with precision.

Table 7 - Component Loadings

	Component			Uniqueness
	1	**2**	**3**	
My child shows curiosity and interest in learning new things	0.840			0.0714
My child demonstrates problem-solving skills appropriate for their age.	0.952			0.0696
I believe my child's memory and recall abilities are age-appropriate	0.902			0.1713
My child can concentrate and focus on tasks for a reasonable duration	0.604			0.2033
I observe my child engaging in imaginative and creative play	0.510			0.3668
My child enjoys spending time with peers and shows interest in forming friendships.			0.952	0.0696
I notice my child expressing empathy and understanding towards others.			0.922	0.1325
My child effectively communicates their thoughts and feelings.			0.415	0.8862
I believe my child demonstrates good manners and social etiquette.			0.920	0.1326
My child engages in cooperative play and teamwork with other children.			0.957	0.0644
I am satisfied with my child's academic progress in school		0.771		0.0931
My child completes homework assignments and classwork with minimal assistance		0.939		0.1133
I believe my child is developing a positive attitude towards le		0.846		0.0926
My child's teachers provide constructive feedback on their academic performance		0.672		0.3092
I observe my child demonstrating an understanding of the subjects taught in school.		0.938		0.0651

Note. 'varimax' rotation was used

The above table shows that the 15 items extract a total of three factors with an eigenvalue of more than 1. All the factor loadings are above 0.4. The first factor with 5 items represents the cognitive development of the children, The second factor represents the social interaction levels of the children and the third factor represents the academic performance of the children. Cognitive development represents the levels of understanding developed by the children for their age. In this case, this understanding is to be interpreted in relevance to the use of interactive mobile games. Cognitive development suggests the learning and decoding capabilities of the children with respect to the developmental process that they are exposed to at different stages of their lives. The next factor is social interaction showing how the children behave in social situations. Every individual needs to be social and for that purpose the steps need to be taken from a very early stage. This children group considered here are crucial for developing such social interaction levels and the impact mobile interactive games would cause would be interesting to understand. Lastly, academic performance showing their

performance in terms of their learning abilities and to perform in the educational activities conducted at schools. The academic performance is based on their educational capabilities and understands how it can be impacted through the use of such games.

As observed from table 7 above, there are three factors having eigenvalue of more than one and to understand how much the children are scoring in them, table 8 shows the descriptives of the three extracted factors below.

Table 8 – Descriptives of Extracted Factors

	N	Mean	Median	SD	Minimum	Maximum
Cognitive Development	266	3.35	3.40	0.548	2.40	4.20
Social Interaction	266	3.69	4.00	0.565	2.80	4.40
Academic Performance	266	3.34	3.20	0.785	1.60	4.60

The highest mean score is that of 3.69 for social interaction followed by 3.35 for cognitive development and 3.34 for academic performance. All three factors have very close mean scores representing equal levels of these attributes in the children considered for the study. It shows that considering the use of interactive mobile games mostly for entertainment purposes and having challenges among the parents in restricting the use of such games in the children, it is seen that the social interaction levels have developed more than the other two. The children are considered to be socially more active compared to cognitive understanding and being best in their academic performances. It shows that mobile interactive games and its usage can impact on increasing the social interactivity levels among the children rather than causing an impact on cognitive and academic development.

Now as all the factors considered in the study are being extracted and discussed, the relationships among these factors are investigated using multiple linear regression.

Based on the first objective of the study, the use of mobile interactive games for education or entertainment purposes, the below two regressions are conducted to understand the impact of the three factors on opting for the education or entertainment purpose of the games.

Table 9 - Model Fit Measures - Education Purpose

				Overall Model Test			
Model	R	R^2	Adjusted R^2	F	df1	df2	p
1	0.797	0.635	0.629	113	4	261	< .001

Table 10 - Model Coefficients - Education Purpose

Predictor	Estimate	SE	t	p
Intercept	-0.0538	0.2228	-0.241	0.809
Cognitive Development	-0.3326	0.0733	-4.534	< .001
Social Interaction	0.5327	0.0582	9.161	< .001
Academic Performance	0.5972	0.0388	15.408	< .001

Table 10 - Model Coefficients - Education Purpose

Predictor	Estimate	SE	t	p
Challenges	0.1524	0.0196	7.757	< .001

The above model with education purpose as the dependent variable and the three factors as the independent variables. With a p-value of less than 0.05, the model is statistically significant. The adjusted R^2 is at 0.629 which means that for a unit change in the independent variables along with challenges, the consideration of interactive mobile games for education purposes changes by 62.9%. Considering the model co-efficient it is seen that all the independent variables have a significant impact on deriving an educational purpose perspective. While cognitive development has a negative impact, the others have a positive impact. The highest impact is exerted by academic performance followed by social interaction. When the consideration of using interactive mobile games are based on educational purposes, it is seen that there are chances that the academic performances of the children would be influencing them to use the games for such purposes. It can be stated that if the academic performance of the children can be enhanced, there are high chances that they would start using the games for educational purposes over entertainment purposes. This can help in overcoming the challenges as well where the use of mobile games for education can be beneficial for both the children and the parents.

Table 11 - Model Fit Measures -Entertainment Purpose

				Overall Model Test			
Model	R	R²	Adjusted R²	F	df1	df2	p
1	0.630	0.397	0.388	43.0	4	261	< .001

Table 12 - Model Coefficients – Entertainment Purpose

Predictor	Estimate	SE	t	p
Intercept	6.9671	0.2851	24.43	< .001
Cognitive Development	-0.1504	0.0939	-1.60	0.110
Social Interaction	-0.4643	0.0744	-6.24	< .001
Academic Performance	-0.0529	0.0496	-1.07	0.287
Challenges	-0.2750	0.0251	-10.94	< .001

The second model with entertainment purpose as the dependent variable and the three factors as the independent variables. With a p-value of less than 0.05, the model is statistically significant. The adjusted R^2 is at 0.388 which means that for a unit change in the independent variables along with challenges, the consideration of interactive mobile games for education purposes changes by 38.8%. Considering the model co-efficient it is seen that all the independent variables have a significant impact on deriving entertainment purpose perspective except for academic performance. All the significant variables have a negative impact and the highest impact is exerted by social interaction followed by the challenges. In this case, the challenges that are occurring among the parents, if not regulated, would lead to using interactive mobile games more for entertainment purposes. It means that the parents need to reduce the challenges and work towards minimising the use of such games for entertainment purposes.

Now in the next segment, the mean score calculations are considered where based on the age groups and age the perspectives are measured.

Table 13 - One-Way ANOVA – Age Group of Children

	F	df1	df2	p
Cognitive Development	475	2	148	< .001
Social Interaction	126	2	167	< .001
Academic Performance	576	2	138	< .001

The above table shows that there is a significant mean difference in the case of all the variables. To understand the levels at which these differences exactly occur post-hoc analysis is conducted (*Refer tables 14 to16 in appendix*).

Across the three parameters, there is a significant mean difference observed among the toddlers and the remaining phases of the children. Pre-schoolers and school-going children do not have significant mean differences. The approach for the toddlers hereby is different across the three factors. This means that this group of children and their approach towards the use of interactive mobile games needs to be different from those who are exposed to the education system. They must be tackled differently with respect to the behavioral influence from the use of the interactive mobile games. The parents of the toddlers need to make their approach differently in order to overcome the challenges and contribute towards their development.

Table 17 - Independent Samples T-Test - Gender

		Statistic	df	p
Cognitive Development	Student's t	1.654 [a]	264	0.099
Social Interaction	Student's t	-0.787	264	0.432
Academic Performance	Student's t	1.850 [a]	264	0.065

[a] Levene's test is significant (p < .05), suggesting a violation of the assumption of equal variances

For the gender consideration, the independent samples t-test shows that there are no significant mean scores observed.

Now, the age group of the children i.e., the phase of childhood that they are currently in is being investigated concerning the entertainment and education purpose responses. It is quite interesting to note that the age group does significantly impact the views towards the educational use of interactive mobile games but not for entertainment purposes.

Table 18 - One-Way ANOVA – Age Group of Children

	F	df1	df2	p
Education Purpose	109	2	155	< .001

The analysis conducted reveals the results of the objectives and a detailed discussion of this analysis is provided in the next section below.

5.   Implications

Mobile games in the present times are widely used as a medium of entertainment among individuals. While for adults it serves as a source of relief in their hectic schedules for children it might pose as an addictive medium of entertainment. There have been many studies such as who has posited the use of mobile games as addictive and having more negative than positive aspects (Baabdullah, 2018; Chen et al., 2018). However, with the evolution of technology, the perspective on mobile games has been altered as it has also been able to generate an educational sense of purpose in the process as well (Costa et al., 2020; Laine & Lindberg, 2020; López-Faican & Jaen, 2020; Martinez et al., 2022). The educational or entertainment benefits of interactive mobile games have always been a source of debate and this study has attempted to provide further insights into the process by conducting a descriptive study. The research here explores the understanding of interactive mobile games as an entertainment or educational purpose of use among different stages of children. The study used three levels of children for understanding their take and included toddlers comprising the age group of 1 to 3 years, pre-schoolers in the age group of 3 to 5 years, and school-going children in the age group of 5 to 17 years. The population of the study is the parents of these children belonging to the three different stages. This method of sample design has been undertaken as responses from toddlers and pre-schoolers cannot be considered effective to use. The discussion on the approach of the children towards mobile games have been found to serve the purpose of entertainment mostly with the parents providing the devices to keep them engaged. However, this habit can lead to a state of concern as it is observed here as well that there are challenges faced by parents to restrict the use of these games. The challenges have been termed as concerning in the studies by (Lazarinis et al., 2020; Rahayu et al., 2021). The dependability of the children on these interactive mobile games for engagement has led to the development of anxiety in them when they are not allowed to use it (Gioia et al., 2022; Wang et al., 2017; Wei et al., 2012). This can lead to various consequences and the future. Some of them are in the form of the behavioral influences discussed in this study - cognitive development, social interaction and academic performance.

The implications can be as follows. Interactive mobile games can generate both positive and negative impacts on cognitive development. Considering the brighter side, there are certain games which are solely designed to enhance problem-solving skills, raise awareness levels, empower memory retention, and enhance critical thinking abilities. These games often require players to strategize, make decisions, and adapt to changing scenarios, which can stimulate cognitive growth. However, the negative aspect of it lies within the use of excessive screen time which can sometimes lead to addiction. Further, exposure to certain types of games may hinder cognitive development, leading to attention deficits, reduced concentration, and impaired memory function. For social interaction, mobile games allow multiplayer features which can contribute towards social interaction among children. It makes them connect with others playing with them, collaborate on levels of the game, and somehow develop a teamwork based mindset. These games provide opportunities for communication, cooperation, and competition, which can help in generating social bonds and interpersonal relationships. However, there is the negative aspect where the fear of excessive gaming leading to isolation coexists. As children may prioritize virtual interactions through this habit, their face-to-face communication abilities might decrease. Moreover, interactions within online gaming communities may expose children to inappropriate language, cyberbullying, and other negative behaviors, impacting their social development (Fahy et al., 2016; Ildırım et al., 2017; Olenik-Shemesh et al., 2014). Such instances often lead to psychological distress among the children impacting heavily on their future behaviour. The relationship between mobile gaming and academic performance is complex and influenced by various other relevant factors in the universe. Some educational games are specifically designed to support learning objectives and make academic concepts easier to understand. Such games are positioned as a way of potentially enhancing academic performance. These games can sometimes make learning more engaging, interactive, and enjoyable, leading to improved retention and comprehension. However, allowing excessive gaming can distract them from traditional methods of learning, their designated study time, disrupt concentration, and negatively impact academic achievement.

It can be established that the use of interactive mobile games can be a source of entertainment and education. But, the main point to concentrate here is that the role of parents can be highly game changing. Their monitoring and allocation of time to the children for using such games can help in striking a balance between the two and use the interactive mobile games to strengthen the overall development of the children.

6.   Limitation

The study is a small scale attempt with a sample size of 266 parents only. A larger group of samples can help in generalising the results better. The samples collected however, represent the parents belonging to different groups of children and have contributed towards achieving a high external validity for the study.

7.   Future Research

There are many interesting areas to dwell on in the future course of research from the findings generated here. The type of relationship coming out of each childhood phase can help in throwing further light into this area of study. For example, the behavioural influence of toddlers are found to be different from the other categories and this can be investigated further. The relationship between the individual characteristics of the children i.e., their cognitive, social, and academic attributes along with the challenges shows that the alteration in the use of interactive mobile games for either educational or entertainment purposes is possible. The study here considers challenges to the use of mobile games but has not included them in terms of addiction levels. In future research directions, the addiction levels of children related to the use of mobile games can be added to the present conceptual model. The results of the study can be used quite effectively in shaping interactive mobile games for entertainment or educational purposes for children according to the stages of childhood.

Conclusion

The widespread use of mobile phones and their applications, particularly games, has brought both advantages and challenges. A study focusing on the perspectives of parents revealed that while mobile games are primarily seen as a source of entertainment for children, they also possess educational value. However, this perceived educational benefit varies with a child's developmental stage. The research suggests that children's cognitive, social, and academic characteristics influence how they interact with these games for learning or fun. Future studies could explore the relationship between childhood stages and game usage more deeply and consider the potential issue of gaming addiction among children. The findings have implications for developing age-appropriate interactive mobile games that balance entertainment with education.

Appendix

Table 14 - Games-Howell Post-Hoc Test – Cognitive Development

		Preschool (3-5 Years)	School Age (5-17 years)	Toddler (1-3 years)
Preschool (3-5 Years)	Mean difference	—	-0.142	-1.051
	p-value	—	0.078	< .001
School Age (5-17 years)	Mean difference		—	-0.909
	p-value		—	< .001
Toddler (1-3 years)	Mean difference			—
	p-value			—

Table 15 - Games-Howell Post-Hoc Test – Social Interaction

	Preschool (3-5 Years)	School Age (5-17 years)	Toddler (1-3 years)

Table 15 - Games-Howell Post-Hoc Test – Social Interaction

		Preschool (3-5 Years)	School Age (5-17 years)	Toddler (1-3 years)
Preschool (3-5 Years)	Mean difference	—	-0.139	-0.757
	p-value	—	0.124	< .001
School Age (5-17 years)	Mean difference		—	-0.618
	p-value		—	< .001
Toddler (1-3 years)	Mean difference			—
	p-value			—

Table 16 - Games-Howell Post-Hoc Test – Academic Performance

		Preschool (3-5 Years)	School Age (5-17 years)	Toddler (1-3 years)
Preschool (3-5 Years)	Mean difference	—	-0.733	-1.83
	p-value	—	< .001	< .001
School Age (5-17 years)	Mean difference		—	-1.10
	p-value		—	< .001
Toddler (1-3 years)	Mean difference			—
	p-value			—

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