IV. RESULTS AND DISCUSSION

The results of the study entitled "Effectiveness of Traditional and Modern Games on Socio-Cognitive Development of children in Biswanath, Assam" are presented below. The purpose of the study was to assess children's socio-cognitive development and explored the role of intervention programme based on traditional games, modern games and blended games on socio-cognitive development of children. The data collected through Probability random sampling technique from Biswanath district, Assam were entered, consolidated, tabulated and analysed statistically using SPSS 27 student evaluation version and discussed under the following heads:

4.1 Descriptive statistics

4.1.1 Socio-Demographic characteristics of the respondents

4.1.2 Overall levels of social and cognitive development of children

4.2 Effect of Socio-Demographic characteristics on Social and Cognitive Development

4.2.1 Predictor variables under social and cognitive development of children.

4.2.2 Levels of social and cognitive development of children based on socio-demographic variables.

4.2.3 Mean difference of social development among children based on socio-demographic variables

4.2.4 Mean difference of cognitive development among children based on socio-demographic variables

4.3 Social and Cognitive Development of children among control and experimental groups based on Traditional, Modern and Blended games

4.3.1 Levels of Social Development among children in control and experimental groups

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4.3.4 Social development and its dimensions in experimental and control group before and after intervention of Modern games

4.3.5 Social development and its dimensions in experimental and control group before and after intervention of Blended games

4.3.6 Cognitive development and its dimensions in experimental and control group before and after intervention of Traditional games

4.3.7 Cognitive development and its dimensions in experimental and control group before and after intervention of Modern games

4.3.8 Cognitive development and its dimensions in experimental and control group before and after intervention of Blended games

4.4 Benefits of interventions of traditional, modern and blended games on Socio-Cognitive Development of Children

4.4.1 Mean and Standard Deviation of the Experimental groups in the Before, During and After Phases of Interventions for social and Cognitive development

4.4.2 Test of Sphericity for Social and cognitive development

4.4.3 Multivariate Analysis of Variance for Social and Cognitive development

4.4.4 Univariate Analysis of Variance for Social and Cognitive Development in the Experimental Groups

4.4.5 Pairwise Comparisons for Before, During and After Intervention Phases for the Experimental Groups on Social and Cognitive development

4.4.6 Profile Plots of experimental groups in social development under various intervention scores.

4.4.7 Profile Plots of social development under before, during and after intervention scores.

4.4.8 Profile Plots of experimental groups in cognitive development under various intervention scores.

4.4.9 Profile Plots of cognitive development under before, during and after intervention scores.

4.1 Descriptive statistics

4.1.1 Socio-Demographic characteristics of the respondents

This section represents the demographic characteristics of the respondents are discussed below–

Table 1: Socio-Demographic characteristics of the respondents

Sl. No.	Socio-Demographic characteristics		Frequency	Percentage
1.	Age	6 years	199	33.7
		7 years	199	33.7
		8 years	192	32.5
2.	Gender	Boys	301	51.0
		Girls	289	49.0
3.	Educational status of mother	10^{th} standard	149	25.3
		12^{th} standard	276	46.8
		Graduation	165	28.0
4.	Educational status of father	10^{th} standard	120	20.3
		12^{th} standard	332	56.3
		Graduation	138	23.4
5.	Occupation of father	Business	252	42.7
		Employee	186	31.5
		Daily wages	152	25.8
6.	Occupation of mother	Homemaker	379	64.2
		Business	58	9.8
		Employee	53	9.0
		Daily wages	100	16.9
7.	Family income	10,000-25000	232	39.3
		26,000-50,000	261	44.2
		50,000-1,00,000	97	16.4
8.	Family type	Nuclear	330	55.9
		Joint	260	44.1
9.	No. of children	One	190	32.2
		Two	235	39.8
		Three	165	28.0
10.	Living area	Rural	211	35.8
		Semi-urban	162	27.5
		Urban	217	36.8
11.	Game preference	Traditional	164	27.8
		Modern	171	29
		Digital	255	43.2

The demographic characteristics of Table 1 reveal that an equal number (33.7%) of children were in the ages of 6 years and 7 years, and the remaining 32.5% were 8 years. Regarding gender, it was observed that the majority (51.0%) of the children were boys, while the remaining 49% were girls. In terms of the educational status of mothers, it was found that the majority (46.8%) had completed up to 12th standard, 28% of them were graduates, and the remaining 25.3% of them had completed 10th standard. On the other hand, regarding the educational status of fathers, it was found that the majority (56.3%) of the fathers' educational status was up to 12th standard, 23.4% of them were graduates, and the remaining 20.3% of them had education up to 10th standard. With respect to the occupation of the father, it was observed that the majority (42.7%) of the fathers were engaged in businesses, 31.5% of them were government/private employees, and the remaining 25.8% were daily wage earners. Regarding mothers' occupation, the majority (64.2%) of mothers were homemakers, 16.9% of them were daily wage earners, 9.8% of them were engaged in business, and the remaining 9.0% of them were government/private employees. In terms of monthly family income, majority (44.2%) earned between Rs. 26,000 and 50,000, 39.3% earned between Rs. 10,000 and 25,000, and 16.4% earned between Rs. 50,000 and 100,000. In terms of family type, the majority (55.9%) of children are from nuclear families, with the remaining 44.1% from joint families. In terms of number of children, the majority (39.8%) come from two-child families, 32.2% from single-child families, and the remaining 28.0% from families with three or more children. In terms of living area, the majority (36.8%) of them lived in urban areas, 35.8% in rural areas, and the remaining 27.5% in semi-urban areas. In terms of game preference, it was shown that the majority (43.2%) prefer to play digital games, 29.0% choose modern games with play materials, and 27.8% prefer traditional games.

4.1.2 Overall levels of Social and Cognitive Development of children.

Initially, the children (6-8 years) were assessed to find out their level of social and cognitive development using Vineland Social Maturity Scale (VSMS) and Malins Intelligence Scale for Indian children (MISIC) and the results were depicted below.

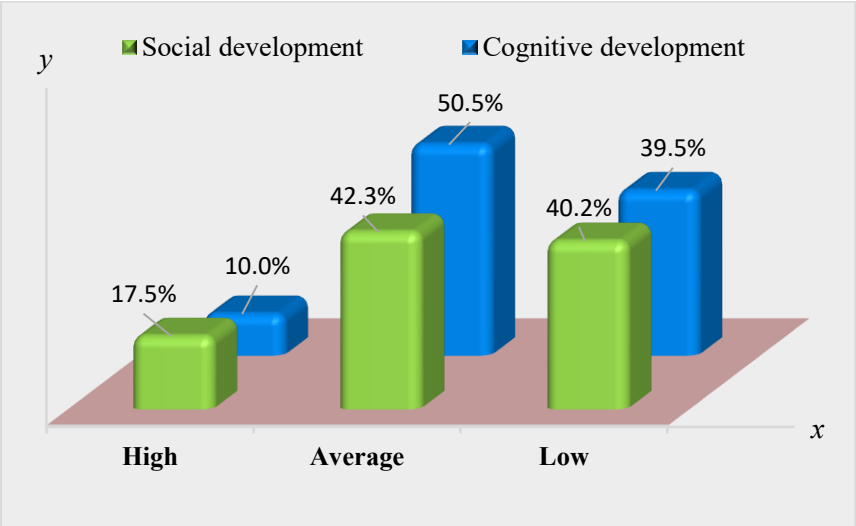

Fig.1 Levels of Social and Cognitive Development of children

Figure 1 demonstrates that the majority of respondents, (42.3%) obtained average level of social development, 40.2% showed low level, and 17.5% obtained high level. Similarly, in terms of cognitive development, the majority (50.5%) were in the average category, 39.5% were in the low category, and the remaining 10.0% were in the high category.

This result shows that majority of the children fall under average category, some of them are still showing lower level of social development. Modern life is surrounded by screens due to the rapid growth of technology. The increased availability and affordability of gadgets like computers, tablets, smartphones, and Televisions have made them more accessible to children. The accessibility of child-focused educational games, apps, and streaming services has further boosted children's screen time Lack of attention, language delays, and communication skills deficiencies are all consequences of prolonged screen time and are important aspects of social development (Goswami & Parekh 2023; Sugiyama et.al 2023). Extended usage of screens diminishes face to face contacts, which are essential for the growth of social skills including empathy, communication, and emotional control. Studies suggest that parents and educators should prioritise fostering better social development by giving children the chance to connect in person with their family and other children instead of depending on screens from an early age. Better communication, conflict resolution, and emotional intelligence are developed in children who have lots of opportunity to engage with their peers. Additionally, they are more comfortable engaging with people both inside and outside of the classroom, which helps them perform better in school (Haowei et.al 2023).

4.2 Effect of Socio-Demographic characteristics on Social and Cognitive development

The effect of Socio-Demographic characteristics on social and cognitive development were assessed and the results are discussed under the following heads.

4.2.1 Predictor variables under Social and Cognitive Development of children.

Association of independent variables on social and cognitive development of children was depicted under regression model separately.

Table 2: Predictor variables of Social Development among children

Variables	Std. Error	Beta	t-value	p value
Age	.439	.115	3.137	0.002**
gender	.707	.043	1.190	0.23
Mother's education	.519	.120	3.087	0.002**
Father's education	.529	.012	.327	0.74
Father's occupation	.461	.023	.592	0.55
Mother's occupation	.313	.000	.012	0.99
Family type	.716	.109	2.987	0.003**
No of children	.444	.090	2.561	0.01*
Living area	.416	-.177	-4.857	0.001**
Family income	.484	-.014	-.394	0.69
Game preference	.421	-.379	-10.664	0.001**

Note. R^2*=.291, F (11, 578) = 21.536, p<.001,* **significant at 1% level, *significant at 5% level

Table 2 shows the predictor variables of social development among children with respect to socio-demographic profile.

To look into the effect of independent variables on children's dependent variables, multiple regression analysis was used. The selected predicting variables such as age, gender, mother's education, father's education, mother's occupation, father's occupation, family types, number of children, living area, family income and game preference was assessed to find out the significant predictors on social development. The R^2 value of .291 revealed that the predictors explained 29.1% variance in the outcome variable with F (11, 578) = 21.536,

p<.001. This result indicates that age of children had a significant positive impact on their social development (β=.115, p=.002). Similarly, mother's education (β=.120, p=.002), family type (β=.109, p=.003) and number of children (β=.090, p=0.01) have positive significant impact on social development of children. However, the remaining variables such as living area ((β=-.177, p<.001) and game preference (β=-.379, p<.001) indicated negative significant impact on social development of children.

Furthermore, the variables gender, fathers' education, fathers' occupation, mothers' occupation and income did not predict significant impact on social development of children under regression model.

Children's social development is greatly influenced by their **age** as they gradually gain social awareness, emotional control, and communication abilities and it can impact their learning style, personality, and the activities as well child care experiences. While older children interact more with peers and acquire collaboration, empathy, and conflict resolution abilities, younger children need on parents for social interaction. The progressive nature of social development across age groups is shown by the way children manage difficult social situations, form closer relationships with others, and understand social norms as they get older.

The research supports the study of (Mayra et.al, 2022) suggesting that the age of children predicts social development by shaping their character through positive stimuli and reducing negative attitudes, crucial for early childhood development.

The **type of family** structure is a significant predictor of social development among children. Family type can affect a child's development in many ways, including how they are cared for, their relationships with caregivers, and their access to resources. The kind of family structure like joint or nuclear has a big impact on how children develop socially. Children in nuclear families may have few social connections within the home, but they also frequently grow up to be independent and self-sufficient. Joint families, on the other hand, offer a wider social network that promotes collaboration, shared accountability, and emotional support. While nuclear families may place more emphasis on individual decision-making and autonomy, joint families, which are exposed to several generations, improve communication skills and social flexibility. The finding is supported by Sharma & Shukla (2023) suggesting that family type nuclear or joint significantly influences the social skills development of children with those from joint families showing higher social skills levels.

Children's social development is significantly predicted by the **number of children** in a family, which can have a significant effect on their development and behaviour. Through everyday interactions and common experiences, a child in multiple children family can promote positive growth, teach them to regulate their anger and resolve conflict, foster empathy and prosocial conduct, and help them understand the feelings and viewpoints of others. In addition, siblings act as early social partners and offer emotional support, which improves flexibility and perspective-taking. They acquire vital social skills through both constructive and difficult interactions, which advances their overall social development. The study is supported by Derakhshanpour et.al. (2020) stating that children from multiple-children's families have higher social skills scores compared to single-child families.

Living area is a significant factor in social development indicating that a child who grows up in a good social environment is more likely to form healthy relationships with others. The finding is supported by the study of Kaur, (2023) stating that children in rural areas often benefit from stronger community ties and greater family involvement, which contribute positively to their social skills compared to their urban counterparts, who may experience higher levels of social isolation and disconnection despite having more access to resources.

Preference of games have significant impact on social development of children in improving communication, relation with peers to memory and focus to teaching logic as well as critical thinking. Different types of games have developmental benefits on children in different ways. For instance, traditional games have an enormous positive impact on children's social development, indicating that these games can enhance various social skills in young children (Khaton et al., 2024). Moreover, studies also suggested that excessive digital games usage indeed have negative effects on children's social development. Hence, the null hypothesis $H_{\circ}1$- There is no significant predictors of social development among children is rejected.

Table 3: Predictor variables of Cognitive Development among children

Variables	Std. Error	Beta	t-value	p value
Age	.373	-.018	.480	.632
gender	.598	.000	.008	.994
Mother's education	.409	.339	8.993	.001**
Father's education	.460	.047	1.229	.219
Father's occupation	.384	.028	.720	.472
Mother's occupation	.257	.032	.844	.399
Family type	.604	-.069	-1.832	.067
No. of children	.382	.029	.780	.436
Living area	.355	-.033	-.871	.384
Family income	.423	.250	6.574	.001**
Game preference	.355	-.077	-2.056	.04*

Note. $R^{2=}$.208, F (11, 578) = 13.840, p<.001, **significant at 1% level, *significant at 5% level

Table 3 depicts the predictors of cognitive development among children (6-8 years). The effect of independent variables on children's cognitive development was examined using multiple regression analysis. The dependent variable cognitive development of children was regressed on predicting variables such as age, gender, mother's education, father's education, mother's occupation, father's occupation, family types, number of children, living area, family income and game preference. The R^2 value of .208 revealed that the predictors explained 20.8% variance in the outcome variable with F (11, 578) = 13.840, p<.001. The results revealed that the variable mother's education ((β=.339, p<.001) and family income (β=.250 p<.001) had positive and significant impact on cognitive development of children. Similarly, the variable game preference also negatively and significantly predicts cognitive development of children (β=-.077, p=.040).

Moreover, age, gender, fathers' education, fathers' occupation, mothers' occupation, family types, number of children, living area, family income has non-significant effect on cognitive development of children.

Educated mothers can positively influence their children's development in a variety of ways. Mothers with higher levels of education are more adept at guiding their children's growth because they understand the value of early learning, developmental milestones, and good parenting techniques. They are more likely to engage in cognitively demanding activities that improve language and problem-solving abilities, like storytelling, reading, and interactive play. A comprehensive environment for development is also ensured by educated

mothers who place a high priority on emotional wellness, healthcare, and nutrition. In addition to providing a better learning environment, educated mothers can act as role models for their children. They can also help their children with schoolwork and guide them through their academic journey. Additionally, they frequently place a high importance on education, fostering an environment that is focused on learning and promotes curiosity, academic success, and cognitive development throughout one's life. The finding is supported by the study of Akabalieva (2024) highlighting that mother's education significantly predicts cognitive development in children, showing stronger positive correlation.

Family income is a significant predictor of cognitive development. Due to financial limitations that restrict access to necessary resources, low-income households frequently find it difficult to create an environment that supports children's cognitive development. Insufficient healthcare, a lack of engaging educational resources, and poor nutrition can all impair learning and cognitive development of children. Financial difficulties can also cause stress in parents, which lowers the number of pleasant interactions with their children and emotional support needed for cognitive development. Insufficient availability of high-quality early childhood education and secure play spaces further limits intellectual stimulation opportunities. Furthermore, living in unstable circumstances and being exposed to unfavourable events can lead to chronic stress, among children which impairs memory, focus, and problem-solving abilities and ultimately affects cognitive development as a whole. Research has indicated that children from low-income families typically exhibit noticeably worse cognitive outcomes than their high-income counterparts. There is evidence linking poorer family income to changes in children's brain connections, and this early disparity in cognitive capacity can have lasting impacts on children. In particular, children from lower-income households show less connection in certain brain regions linked to memory, self-referential thinking, and mind wandering (Tomasi & Volkow, 2021).

Children's preferred games, whether they are traditional, modern games with play materials or digital, have significant effects on cognitive development because they shape brain pathways through participation and various kinds of stimuli. Through peer interaction and established rules, traditional games frequently improve memory, attention, and social reasoning. Through the encouragement of hands-on exploration, modern games involving play materials promote sensorimotor integration, creativity, and executive functioning. When played in a developmentally appropriate manner, digital games can help with hand-eye

coordination, spatial skills, and problem-solving; nevertheless, overuse might impede social learning in the real world. Children's preferred game types therefore impact learning outcomes and developmental paths by determining the kind and level of cognitive stimulation they get.

The finding is supported by the study of Mulaudzi et al., (2022) stating that traditional games stimulate cognitive development by engaging children in activities that require them to think critically and strategically, thereby improving their ability to understand and process information. Moreover, modern games offer numerous benefits in children including improved problem-solving abilities, critical thinking, and logical reasoning by challenging them to think critically, recognize patterns, and make decisions (Artamevia et al., 2023; Amatullah et al., 2022). In contrast, long-term usage of digital games can harm children's cognitive development by causing problems with concentration, delayed language development, and diminished learning capacity (Huang, 2023). Hence, the null hypothesis H_o2- There is no significant predictors of cognitive development among children is rejected.

4.2.2 Levels of Social and Cognitive Development of children based on socio-demographic variables.

The levels of social and cognitive development of children were analysed based on independent variables like age, gender, mother's education, father's education, mother's occupation, father's occupation, family types, number of children, living area, family income and game preference. The results were distributed in frequency and percentage are shown below-

Table 4: Percentage distribution of Social Development among children

Socio-Demographic characteristics		Levels of Social development			
		High	Average	Low	Total
		N (%)	N (%)	N (%)	N (%)
Age	6 years	27 (13.6)	78 (39.2)	94 (47.2)	199 (100)
	7 years	34 (17.1)	78 (39.2)	87 (43.7)	199 (100)
	8 years	42 (21.9)	94 (49.0)	56 (29.2)	192 (100)
Gender	Boys	51 (16.9)	118 (39.2)	132 (43.9)	301 (100)
	Girls	52 (18.0)	132 (45.7)	105 (36.3)	289 (100)

Socio-Demographic characteristics		Levels of Social development			
		High	**Average**	**Low**	**Total**
		N (%)	**N (%)**	**N (%)**	**N (%)**
Educational status of mother	10th standard	22 (14.8)	53 (35.6)	74 (49.7)	149 (100)
	12th standard	39 (14.1)	116 (42.0)	121 (43.8)	276 (100)
	Graduation	42 (25.5)	81 (49.1)	42 (25.5)	165 (100)
Educational status of father	10th standard	22 (18.3)	44 (36.7)	54 (45.0)	120 (100)
	12th standard	58 (17.5)	146 (44.0)	128 (38.6)	332 (100)
	Graduation	23 (16.7)	60 (43.5)	55 (39.9)	138 (100)
Occupation of father	Business	37 (14.7)	90 35.7)	125 (49.6)	252 (100)
	Employee	42 (22.6)	86 (46.2)	58 (31.2)	186 (100)
	Daily wages	24 (15.8)	74 (48.7)	54 (35.5)	152 (100)
Occupation of mother	Homemaker	67 (17.7)	161 (42.5)	151 (39.8)	379 (100)
	Business	12 (20.7)	23 (39.7)	23 (39.7)	58 (100)
	Employee	6 (11.3)	27 (50.9)	20 (37.7)	53 (100)
	Daily wages	18 (18.0)	39 (39.0)	43 (43.0)	100 (100)
Family income (monthly)	10,000-25000	43 (18.5)	109 (47.0)	80 (34.5)	232 (100)
	26,000-50,000	47 (18.0)	96 (36.8)	118 (45.2)	261 (100)
	50,000-1,00,000	13 (13.4)	45 (46.4)	39 (40.2)	97 (100)
Family type	Nuclear	46 (13.9)	134 (40.6)	150 (45.5)	330 (100)
	Joint	57 (21.9)	116 (44.6)	87 (33.5)	260 (100)
No. of children	One	28 (14.7)	70 (36.8)	92 (48.4)	190 (100)
	Two	36 (15.3)	113 (48.1)	86 (36.6)	235 (100)
	Three or more	39 (23.6)	67 (40.6)	59 (35.8)	165 (100)
Living area	Rural	50 (23.7)	93 (44.1)	68 (32.2)	211 (100)
	Semi-urban	32 (19.8)	80 (49.4)	50 (30.9)	162 (100)
	Urban	21 (9.7)	77 (35.5)	119 (54.8)	217 (100)
Game preference	Traditional	63 (38.4)	69 (42.1)	32 (19.5)	164 (100)
	Modern	25 (14.6)	85 (49.7)	61 (35.7)	171 (100)
	Digital	15 (5.9)	96 (37.6)	144 (56.5)	255 (100)

Table 4 represents percentage distribution of Social Development among children. According to the findings, majority (47.2%) of the children **aged** 6 had low levels of social

development, 39.2% had average levels of social development, and 13.6% reported high levels of social development. Furthermore, among children aged 7 years, the majority (43.7%) had lower levels of social development, 39.2% had average levels, and the remaining 17.1% showed high levels of social development. In case of 8-years, the majority (49.0%) had average social development, 29.2% performed at a low level, and 21.9% had high social development.

Regarding **gender,** it was observed that majority (43.9%) of boys represented low level of social development, 39.2% had average social development and rest of them (16.9%) had high social development. While majority (45.7%) of girls had average social development, 36.3% had low level and remaining 18.0% children were showing high social development.

Regarding the **educational status of mothers**, it was found that the majority (49.7%) of children whose mothers had an educational status of 10th standard had low social development, 35.6% had an average level, and the remaining 14.8% of children were showing high social development. With reference to mothers who had education up to 12th standard, it was found that the majority (43.8%) of children had lower social development, 42.0% of them performed average in social development, and the rest (14.1%) of them were at a high level of social development. While, in the case of graduate mothers, the majority (49.1%) of children were in the average category, and an equal number of children (42.0%) were showing high and low levels of social development.

Regarding the **educational status of fathers**, it was found that the majority (45.0%) of children whose fathers had an educational status of 10th standard had low social development, 36.7% had an average level, and the remaining 18.3% of children were showing high social development. With reference to fathers who had education up to 12th standard, it was found that the majority (44.0%) of children had average social development, 38.6% of them performed lower in social development, and the rest (17.5%) of them were at a high level of social development. While, in the case of graduate fathers, the majority (43.5%) of children were in the average category, 39.9% of them were showing a low level, and the remaining 16.7% were under a high level of social development.

With respect to **fathers' occupation,** it was observed that the majority (49.6%) of children of businessman fathers were showing a lower level of social development, 35.7% of them showing average social development, and the remaining 14.7% were under a high level

of social development. Again, children of govt./private employee fathers, the majority (46.2%) of them were in the average category, 31.2% were under the low category, and the remaining 22.6% of them were showing a high level of social development. In the case of daily wage earner fathers, the majority (48.7%) of children had average social development, 35.5% of them were under low level, and the rest (15.8%) of them were in the high category of social development.

In terms of **mother's occupation,** the majority (42.5%) of children raised by homemakers had average social development, 39.8% had low social development, and the remaining 17.7% had high social development. In the case of mothers who worked in business, an equal number (39.7%) of their children had average or low levels of social development, with the remaining 20.7% having high levels of social development. Furthermore, among children of government/private employee mothers, the majority (50.9%) shown average social development, 37.7% demonstrated low social development, and the remaining 11.3% demonstrated high social development. In terms of daily wage earner mothers, the majority of their children (43.0%) had low social development, 39.0% had average social development, and the remaining 18.0% had high social development.

In terms of monthly **family income**, the majority (47%) of children with monthly incomes between Rs. 10,000 and Rs. 25,000 were found to be in the average category of social development; 34.5% were in the lower category, and the remaining 18.5% were in the high category. In the Rs. 26,000-50,000 monthly income range, the majority (45.2%) of children had low social development, 36.8% had average social development, and the remaining 18.0% had high social development. In the household income range of Rs. 50,000-100,000, majority (46.4%) of children had average social development, 40.2% had low social development, and 13.4% had high social development.

Regarding **Family type,** majority (45.5%) of nuclear family children were showing low level of social development, 40.6% had average level and remaining 13.9% had high level of social development. While the majority (44.6%) of children in joint families were showing an average level of social development, 33.5% had a lower level of social development, and the remaining 21.9% had a high level of social development.

In case of **number of children** in family, majority (48.4%) of children of single child family had lower level of social development, 36.8% of them had average level and remaining 14.7% had high level of social development. While, majority (48.1%) of them in

double children family had average level of social development, 36.6% of them were in low category and remaining 15.3% had high level of social development. Additionally, majority (40.6%) of the children in three children family had average level of social development, 35.8% of them had lower level and remaining 23.6% of them had high level of social development.

In terms of **living area**, the majority (44.1%) of children in rural areas had average social development, 32.2% had low social development, and the remaining 23.7% had high social development. While the majority (49.4%) of semi-urban children showed average social development, 30.9% had lower levels, and 19.8% had high levels. On the other side, it was found that most urban children (54.8%) had lower social development, 35.5% had average social development, and 9.7% had high social development.

Regarding children's **game preferences**, it was found that the majority (42.1%) of those who liked to play traditional games had an average level of social development, 38.4% had a high level, and the remaining 19.5% had a lower level of social development. The majority of children who prefer modern games (49.7%) had an average level of social development, 35.7% had a lower level, and 14.6% had a high level of social development. While the majority (56.5%) of children who prefer digital games had low social development, 37.6% had average social development, and only 5.9% had high social development.

Table 5: Percentage distribution of Cognitive Development among children

Socio-Demographic characteristics		Levels of Cognitive development			
		High N (%)	Average N (%)	Low N (%)	Total N (%)
Age	6 years	22 (10.1)	102 (51.3)	77 (38.7)	199(100)
	7 years	19 (9.5)	99 (49.7)	81 (40.7)	199 (100)
	8 years	20 (10.4)	97 (50.5)	75 (39.1)	192 (100)
Gender	Boys	30(10.0)	155 (51.5)	116 (38.5)	301 (100)
	Girls	29 (10.0)	143 (49.5)	117 (40.5)	289 (100)
Educational status of mother	10^{th} standard	7 (4.7)	51 (34.2)	91 (61.1)	149 (100)
	12^{th} standard	19 (6.9)	147 (53.3)	110 (39.9)	276 (100)
	Graduation	33 (20.0)	100 (60.6)	32 (19.4)	165 (100)

Socio-Demographic characteristics		Levels of Cognitive development			
		High N (%)	Average N (%)	Low N (%)	Total N (%)
Educational status of father	10th standard	13 (10.8)	60 (50.0)	47 (39.2)	120 (100)
	12th standard	33 (9.9)	170 (51.2)	129 (38.9)	332 (100)
	Graduation	13 (9.4)	68 (49.3)	57 (41.3)	138 (100)
Occupation of father	Business	32 (12.7)	123 (48.8)	97 (38.5)	252 (100)
	Employee	15 (8.1)	87 (46.8)	84 (45.2)	186 (100)
	Daily wages	12 (7.9)	88 (57.9)	52 (34.2)	152 (100)
Occupation of mother	Homemaker	33 (8.7)	194 (51.2)	152 (40.1)	379 (100)
	Business	2 (3.8)	28 (52.8)	23 (43.4)	53 (100)
	Employee	7 (12.1)	25 (43.1)	26 (44.8)	58 (100)
	Daily wages	17 (17.0)	51 (51.0)	32 (32.0)	100 (100)
Family income	10,000-25000	10 (4.3)	117 (50.4)	105 (45.3)	232 (100)
	26,000-50,000	20 (7.7)	142 (54.4)	99 (37.9)	261 (100)
	50,000-1,00,000	29 (29.9)	39 (40.2)	29 (29.9)	97 (100)
Family type	Nuclear	42 (12.7)	162 (49.1)	126 (38.2)	330 (100)
	Joint	17 (6.5)	136 (52.3)	107 (41.2)	260 (100)
No. of children	One	14 (7.4)	94 (49.5)	82 (43.2)	190 (100)
	Two	24 (10.2)	130 (55.3)	81 (34.5)	235 (100)
	Three or more	21 (12.7)	74 (44.8)	70 (42.4)	165 (100)
Living area	Rural	20 (9.5)	108 (51.2)	83 (39.3)	211 (100)
	Semi-urban	18 (11.1)	81 (50.0)	63 (38.9)	162 (100)
	Urban	21 (9.7)	109 (50.2)	87 (40.1)	217 (100)
Game preference	Traditional	9 (5.5)	74 (45.1)	81 (49.4)	164 (100)
	Modern	34 (19.9)	90 (52.6)	47 (27.5)	171 (100)
	Digital	16 (6.3)	134 (52.5)	105 (41.2)	255 (100)

Table 5 represents percentage distribution of cognitive development among children. Result shows that in the **age** group of six years, the majority (51.3%) of the children had an average level of cognitive development, 38.7% had a low level of cognitive development, and the remaining 10.1% had a high level of cognitive development. Furthermore, the majority (49.7%) of children aged 7 years had average cognitive development, 40.7% had low levels,

and the remaining 9.5% had high levels of cognitive development. While the majority (50.5%) of 8-year-old children showed average cognitive development, 39.1% had low levels, and the remaining 10.4% had high levels.

Regarding **gender,** it was found that majority (51.5%) of boys had average level of cognitive development, 38.5% had low cognitive development and rest of them (10.0%) had high cognitive development. While majority (49.5%) of girls had average cognitive development, 40.5% had low level and remaining 10.0% children were showing high level of cognitive development.

Results also revealed that, regarding the **educational status of mothers**, it was found that the majority (61.1%) of children whose mothers had an educational status of 10^{th} standard had low cognitive development, 34.2% had an average level, and the remaining 4.7% of children were showing high cognitive development. With reference to mothers who had education up to 12^{th} standard, it was found that the majority (53.3%) of children had average cognitive development, 39.9% of them performed low in cognitive development, and the rest (6.9%) of them were at a high level of cognitive development. While, in the case of graduate mothers, the majority (60.6%) of children were in the average category, 19.4% were showing low levels, and the remaining 20.0% had high cognitive development.

Regarding the **educational status of fathers,** it was observed that majority (50.0%) of children whose fathers had educational status of 10^{th} standard had average cognitive development, 39.2% had low level, and the remaining 10.8% of children were showing high cognitive development. With reference to fathers who had education up to 12^{th} standard, it was found that the majority (51.2%) of children had average cognitive development, 38.9% of them performed lower in cognitive development, and the rest (9.9%) of them were at a high level of cognitive development. While, in the case of graduate fathers, the majority (49.3%) of children were in the average category, 41.3% of them were showing low level, and the remaining 9.4% were showing high level of cognitive development.

With respect to **fathers' occupation**, from the Table 5, it was noticed that the majority (48.8%) of children of businessman fathers were showing average level of cognitive development, 38.5% were showing low level, and the remaining 12.7% showed high level of cognitive development. Moreover, children of govt./private employee fathers, the majority (46.8%) of them were in the average category, 45.2% were in the low category, and the remaining 8.1% of them were showing high level of cognitive development. In case of daily

wage earner fathers, the majority (57.9%) of children had average cognitive development, 34.2% of them had lower level, and the rest (7.9%) of them were in the high level of cognitive development.

In terms of **mother's occupation,** results showed that the majority (51.2%) of children raised by homemakers had average cognitive development, 40.1% had low cognitive development, and the remaining 8.7% showed high cognitive development. In case of mothers who worked in business, majority (52.8%) of their children had average cognitive development, 43.4% had low level with the remaining 3.8% having high level of cognitive development. Furthermore, among children of government/private employee mothers, the majority (44.8%) have shown low cognitive development, 43.1% demonstrated average cognitive development, and the remaining 12.1% had high cognitive development. In terms of daily wage earner mothers, the majority of their children (51.0%) had average cognitive development and 32.0% showed low cognitive development, and the remaining 17.0% had high cognitive development.

Findings also revealed that in terms of monthly **family income,** the majority (50.4%) of children with monthly incomes between Rs. 10,000 and Rs. 25,000 were found to be in the average category of cognitive development, 45.3% were in the lower category, and the remaining 4.3% were in the high category. In the Rs. 26,000-50,000 monthly income range, the majority (54.4%) of children had average cognitive development, 37.9% had low cognitive development, and the remaining 7.7% had high cognitive development. In the household income range of Rs. 50,000-100,000, majority (40.2%) of children had average cognitive development, and equal number i.e. 29.9% had high and low cognitive development.

Regarding **Family type**, it was found that majority (49.1%) of nuclear family children were showing average level of cognitive development, 38.2% had low level and remaining 12.7% had high level of cognitive development. While the majority (52.3%) of children in joint families were showing an average level of cognitive development, 41.2% had lower level of cognitive development, and the remaining 6.5% had high level of cognitive development.

Results also revealed that in case of **number of children** in family, majority (49.5%) of children of single child family had average level of cognitive development, 43.2% of them had low level and remaining 7.4% had high level of cognitive development. While, majority (55.3%) of them in double children family had average level of cognitive development,

34.5% of them were in low category and remaining 10.2% had high level of cognitive development. Additionally, majority (44.8%) of the children in three or more children family had average level, 42.4% of them had lower level and remaining 12.7% of them had high level of cognitive development.

In terms of **living area,** it was showed that the majority (51.2%) of children in rural areas had average cognitive development, 39.3% had low level and the remaining 9.5% showed high cognitive development. While the majority (50.0%) of semi-urban children showed average cognitive development, 38.9% had lower levels, and 11.1% had high level of cognitive development. On the other hand, it was found that most urban children (50.2%) had average cognitive development, 40.1% had low cognitive development, and 9.7% had high cognitive development.

Regarding children's **game preferences,** it was found that the majority (49.4%) of children who play traditional games had low level of cognitive development, 45.1% showed average level, and the remaining 5.5% had high level of cognitive development. Moreover, the majority of the children who prefer modern games (52.6%) had an average level of cognitive development, 27.5% had a lower level, and remaining 19.9% had high level of cognitive development. While the majority (52.5%) of children who prefer digital games had average cognitive development, 41.2% had low level and only 6.3% of them performed high cognitive development.

4.2.3 Mean difference of Social Development among children based on socio-demographic variables

The mean difference in social development among children was also analysed using mean, SD, t-test and ANOVA test and the results are discussed under following.

Table 6: Mean, SD and t values of Social Development among children based on Gender and Family type

Demographic characteristics		Mean	SD	t-value	p value
Gender	Boys	95.19	9.75	-1.835	0.06 ^{NS}
	Girls	96.66	9.66		
Family type	Nuclear	94.35	9.67	-4.449	0.001**
	Joint	97.89	9.46		

**Significant at 1% level NS=non-significant

Table 6 represents Mean, SD and t values of social development among children based on gender and family type. Results demonstrates that girls have a higher mean value in social development (mean = 96.66% and SD = 9.66) than boys (mean = 95.19 and SD = 9.75). However, no significant difference was found between the mean values of boys and girls in social development.

Regarding **family types,** children of joint families had a higher mean value (mean=97.89, SD=9.46) in social development than the children of nuclear families, where mean=94.35, SD=9.67, and a statistically significant difference was observed.

The joint family structure offers a narrative of shared experiences, support, and a collective upbringing that makes a lasting impression on the children's life in the tapestry of familial ties. Along with their parents, children in a joint family are also surrounded by their grandparents, uncles, aunts, and cousins. Joint families provide children a broader support system, fostering social skills through interactions with multiple relatives, which enhances emotional regulations and adaptability in social settings. For instance, children in joint families tend to develop stronger communication skills and a sense of belongingness, as they engage with various family members regularly which is supported by the study of Sharma & Shukla (2023). Conversely, the study of Gurav & Vageriya, (2019) states that nuclear families can offer a more focused environment, they may limit children's exposure to diverse social interactions, stronger bonds of attachment and togetherness among various family members and relations which are crucial for their social development. Additionally, study of Tiwari et al. (2020) support that children raised in nuclear families may have fewer opportunities to engage with a broader range of peers and adults, potentially hindering their social skills and adaptability in varied social contexts. Moreover, studies suggest that interactions within joint family networks significantly enhance children's emotional and social well-being and sense of competence (Wikle & Hoagland, 2019). Thus, while nuclear families offer certain advantages, they may also pose limitations on children's social development due to reduced exposure to diverse social settings.

Table 7: Mean, SD and F values of Social Development among children based on Socio-Demographic variables

Socio-Demographic characteristics		Mean	SD	F value	p value
Age	6 years	93.65	9.61	12.36	0.001**
	7 years	95.73	9.55		
	8 years	98.44	9.48		
Educational status of mother	10^{th} standard	93.16	9.81	20.30	0.001**
	12^{th} standard	95.15	9.37		
	Graduation	99.66	9.17		
Educational status of father	10^{th} standard	95.63	9.31	.837	0.17^{NS}
	12^{th} standard	96.12	9.75		
	Graduation	95.65	10.09		
Occupation of father	Business	95.16	9.96	1.35	0.26^{NS}
	Govt./private Employee	96.60	9.89		
	Daily wages	96.32	9.10		
Occupation of mother	Homemaker	96.05	9.75	0.38	0.76^{NS}
	Business	96.20	10.83		
	Employee	96.33	8.14		
	Daily wages	94.98	9.82		
Family income	Rs. 10,000-25000	96.66	9.74	1.17	0.31^{NS}
	Rs. 26,000-50,000	95.35	9.80		
	Rs. 50,000-1,00,000	95.61	9.48		
No. of children	One	94.26	9.63	6.13	0.002**
	Two	95.88	9.61		
	Three or more	97.86	9.70		
Living area	Rural	98.02	9.17	21.45	0.001**
	Semi-urban	97.61	8.60		
	Urban	92.59	9.21		
Game preference	Traditional	101.68	9.45	78.19	0.001**
	Modern	95.83	8.33		
	Digital	91.18	9.73		

** significant at 1% level, NS=non-significant

Table 7 displays Mean, SD and F values of social development among children based on socio-demographic variables. From the results, it was observed that children in the 8th age group showed higher mean value i.e. mean=98.44, SD=9.48 than 6 years (mean=93.65, SD=9.61) and 7 years (mean=95.73, SD=9.55) which was statistically significant at 1%level.

Due to the growing independence of children and increased involvement in school settings and extracurricular activities, children gradually have more possibilities for social interaction as they get older. These environments offer a variety of social experiences that support the growth of critical social skills like empathy, cooperation, communication, and conflict resolution. Children are exposed to group activities, collaborative learning, and peer interactions in school settings, which strengthens their social skills. By encouraging cooperation, leadership, and common goal-setting, extracurricular activities like sports teams and creative activities help to further develop social competence. As a result, children's relationship with friends gets stronger and overall social development are greatly influenced by the slow increase of social encounters with age. The findings supported by the study of Broesch et.al. (2021) stating that as children grow older, they typically gain more opportunities for social interaction, and interaction opportunities and attention patterns vary significantly with age. In fact, age-related experiences contribute significantly to children's ability to navigate social contexts effectively, the more contacts a child has with people, the more properly socialized he becomes, fostering better interpersonal relationships (Tulviste et.al 2019).

From the results it was also found that regarding **educational status of mother,** children performed higher mean value who had graduate mothers i.e. mean=99.66, SD=9.17 than mothers' education with 10th standard (mean= 93.16, SD=9.81) and 12th standard (mean=95.15, SD=9.37) and also significant difference was found with F=20.30 at p<.001. therefore, it can be concluded that children with higher educated mothers performed better in social development than less educated mothers.

The development of a child is greatly influenced by a mother who serve as the child's primary caretaker. They shape the child's overall growth and development through interactions, caring, and the provision of a safe environment for learning and discovery throughout early life. They act as role models by exhibiting admirable social skills that children can watch and absorb, like good communication, empathy, and problem-solving. Additionally, they foster a stimulating home environment that is full of possibilities for social interaction, such as interactive play, storytelling, and conversations, all of which support the

development of social skills. Furthermore, educated mothers take an active role in the education of their children by supporting their academic progress, fostering curiosity, and organising extracurricular learning opportunities. Their participation boosts children' confidence in social situations and improves their academic performance. Additionally, by encouraging their enjoyment in learning, they develop social competence, flexibility, and critical thinking all of which are crucial for negotiating interpersonal interactions.

The finding supported by the Study of Huang et al., (2022) & Cuartas, (2022) suggesting that educated mothers invest more time in childcare activities tailored to their children's developmental needs and maternal education positively influences parenting practices, leading to increased engagement in stimulating activities and better access to early childhood education, which are crucial for their development. Hamayel et.al. (2022) also stating that educated mothers influences socialization of children by emphasizing autonomy and self-enhancement, while mothers with lower educational attainment often emphasize stability and moral values, reflecting a more collectivistic approach to socialization. Similar results suggest that mothers with higher education levels tend to adopt more authoritative parenting styles, promoting open communication and emotional support (Anastasiu & Georgescu, 2024).

Results also revealed that in case of **fathers' education,** though children of graduate fathers were higher, i.e. mean=95.65, SD=10.09 than fathers' education up to 10^{th} standard Results also revealed that in case of **fathers' education,** though children of graduate fathers were higher, i.e. mean=95.65, SD=10.09 than fathers' education up to 10^{th} standard (mean= 95.63, SD=9.31) and 12^{th} standard (mean=96.12, SD=9.75), but no significant difference was observed.

Regarding **fathers' occupations,** it was shown that children of government/private employee fathers had a higher mean value in social development (mean=96.60, SD=9.89) than daily wage earner fathers (mean=96.32, SD=9.10) and fathers who earn from business (mean=95.16, SD=9.96). However, no significant difference was found in the children's social development.

In terms of **mother's occupation,** results showed that children of government/private employee mothers had a higher mean value in social development (mean=96.33, SD=8.14) than those of business mothers (mean=96.20, SD=10.83), homemaker mothers (mean=96.05, SD=9.75), and daily wage earners mothers (mean=94.98, SD=9.82). However, no significant difference was observed in the children's social development.

Results also reveal that in case of **family income**, it was observed that children who had lower family income (Rs. 10,000-25000) showed higher mean value in social development i.e. mean= 96.66, SD=9.74, than those of higher family income (50,000-1,00,000) where mean=95.61, SD=9.48, followed by medium income (Rs. 26,000-50,000) where mean=95.35 and SD=9.80. However, no significant difference was observed in social development among children.

Regarding **number of children** in the family, it was observed that family with multiple children obtained higher mean value (mean=97.86, SD=9.70) in social development than those of two children in the family (mean=95.88, SD=9.61) followed by single child in a family (mean=94.26, SD=9.63) a significant difference was found at 1% level.

Sibling relationships significantly impact a child's social development from early childhood through adulthood. Siblings make a pivotal contribution to children's growth in understanding the mental states of others, markedly enhancing their capacity to perceive and comprehend the emotional experiences, thought processes, intentions, and beliefs of those around them. Children gain social competence from these relationships because they frequently have the chance to communicate with others, resolve disagreements, control their emotions and can resolve conflicts in a reasonably safe setting because sibling encounters are impromptu and frequent. Sibling interactions frequently resemble social exchanges that take place in larger peer and societal contexts, involving collaboration, competitiveness, and compromise. Sibling interactions are also very important for controlling emotions. Children learn to regulate their emotions, gain self-control, and recognise emotional signs in others through both positive and negative emotional interactions with their siblings. Since children have to understand and react to their siblings' feelings, these experiences help them develop empathy and emotional intelligence.

The finding is supported by the study of Howe et al., (2022), Tan et al., (2022) & Kramer et al., (2019) suggesting that the presence of multiple children in a family provides opportunities for children to learn how to interact with peers, manage conflicts, and regulate both positive and negative emotions in socially appropriate ways. This familial context facilitates children's development of an understanding of the multifaceted nature of social relationships, in which interactions with family members can range from close and affectionate to competitive, unkind, jealous, or aggressive behaviours. Sibling rivalry may happen frequently, but it will teach them forgiveness, fairness, and sharing.

Sibling connections may also promote social development by providing a setting for modelling and observational learning. Older siblings frequently serve as role models for younger siblings, influencing their attitudes, behaviours, and social skills. This dynamic promotes social growth by making it easier for individuals to internalise societal norms and expectations. Sibling relationships are therefore a vital developmental setting that equips children for effective social interactions across a range of life domains.

In case of **living area,** results revealed that children living in rural areas had high mean value in social development (mean=98.02, SD=9.17), as compared with semi-urban (mean=97.61, SD=8.60) and urban children (mean=92.59, SD=9.21) and also significant difference was observed at 1% level.

Children in rural areas often grows up in an environment surrounded by greenery and open spaces, which encourages outdoor activities and group play. Children in urban areas typically spend most of their time indoors, while most children in rural areas spend most of their time outside. This environment contributes to their interaction with peers, helps in learning communication and builds a strong bond among the peers as well as others.

This finding is supported by Safari & Khaftani (2022), suggesting that green places or playground encourage diverse play activities and interactions and cooperations among children that could improve social development. In addition, research indicates that children's exposure to green spaces and the natural world can improve their prosocial behaviour and prepare them for social engagement in the classroom (Putra et al., 2020, Zhiguleva, 2020).

With respect to **game preference**, it was observed that, children who prefer traditional games performed better mean score in social development (mean=101.68, SD=9.45) than those of children who prefer modern games (mean=95.83, SD=8.33) and digital games (mean=91.18, SD=9.73) and also significant difference found at 1% level.

Traditional games play a crucial role for social development in children. They learn to cooperate, be a part of a group, socialise, and mingle with their peers through traditional games because they engage with each other in person.

The study of Dasmadi et al., (2023) support the finding stating that engaging in traditional games directly fosters children's social adjustment, which is a crucial initial step in their social development, as it provides them with valuable learning experiences including the capacity to adapt, exhibit self-control, demonstrate empathy, adhere to rules, interact with

others, collaborate, and show respect. Research indicates that when children interact in a positive environment with a supportive community, their behaviour and social development improve, with traditional games playing an important role in improving their social interactions and interpersonal intelligence (Sriwidayati et al., 2020). Despite the popularity of digital games, children must also be introduced to traditional games in order to enhance their social skills (Bondy & Ramos, 2021).

4.2.4 Mean difference of Cognitive Development of children based on socio-demographic variables

The cognitive development of children was also analysed based on the socio-demographic variables using Mean, SD, t-test and ANOVA test and results are discussed under following.

Table 8: Mean, SD and t values of Cognitive Development among children based on Gender and Family type

Socio-Demographic characteristics		Mean	SD	t-value	p value
Gender	Boys	92.65	7.94		0.81 ^{NS}
	Girls	92.81	7.90	-.240	
Family type	Nuclear	93.02	8.28		0.32 ^{NS}
	Joint	92.37	7.43	.984	

NS-Non Significant

Table 8 represents Mean, SD and t values of cognitive development among children based on gender and family type.

Results revealed that in case of **gender**, even though girls obtained higher mean value in cognitive development (mean=92.81, SD=92.65) than boys (mean=92.65, SD=7.94), there was no significant difference found among children in cognitive development.

The research finding supported by the study of Shan et.al. 2023 and Giofre, 2024 suggesting that no significant differences in cognitive outcomes of children based on **gender,** where both boys and girls develop and performs similar cognitive skills during early childhood.

Regarding **family type**, children of nuclear family had higher mean value in cognitive development (Mean=93.02, SD=8.28) than those of joint family (mean= 92.37, SD=7.43). however, no significant difference was observed among children in cognitive development.

The result outcome supports the study with (Mathew & Dani, 2024) suggesting that children whether coming from nuclear or joint families doesn't show any difference in cognitive development. The matter of fact is that, today most children have access to a primary education across most of the globe, an opportunity for previous generation might not have been lacking. Hence, the school and institutions adjacent to it along with family play a huge role in the cognitive development of children.

Table 9: Mean, SD and F values of Cognitive Development among children based on Socio-Demographic variables

Demographic characteristics		Mean	SD	F value	P value
Age	6 years	92.74	8.09	0.225	0.79 ^{NS}
	7 years	92.46	7.58		
	8 years	93.00	8.10		
Educational status of mother	10^{th} standard	89.18	6.33	46.734	0.001**
	12^{th} standard	92.07	7.21		
	Graduation	97.05	8.40		
Educational status of father	10^{th} standard	93.15	8.61	.545	0.58 ^{NS}
	12^{th} standard	92.82	7.89		
	Graduation	92.16	7.34		
Occupation of father	Business	92.84	8.29	2.65	0.07 ^{NS}
	Employee	93.73	7.84		
	Daily wages	91.76	7.37		
Occupation of mother	Homemaker	94.17	8.30	1.851	0.13 ^{NS}
	Business	91.20	7.41		
	Employee	92.90	8.12		
	Daily wages	92.54	7.82		
Family income	10,000-25000	90.93	6.63	34.434	0.001**
	26,000-50,000	92.24	7.06		

Demographic characteristics		Mean	SD	F value	P value
	50,000-1,00,000	98.35	7.15		
No. of children	One	92.20	7.98	.766	0.46 NS
	Two	93.16	7.76		
	Three or more	92.73	8.07		
Living area	Rural	92.95	7.81	.451	0.63 NS
	Semi-urban	92.33	8.01		
	Urban	92.99	7.94		
Game preference	Traditional	91.39	6.86	18.004	0.001**
	Modern	95.84	8.95		
	Digital	91.73	7.43		

** significant at 1% level, *significant at 5% level, NS-non significant

Table 9 demonstrates Mean, SD and F values of Cognitive Development among children based on socio-demographic variables**.**

Results show that in case of **age,** children of 8 years had higher mean value i.e. mean=93.00, SD=8.10, than children of 6 years (Mean=92.74, SD=8.09) and 7 years (mean=92.46, SD=7.58). However, no significant difference was observed among them in cognitive development.

The contradictory study highlights that age, significantly influences cognitive outcomes in preschool children, with older children showing better cognitive abilities compared to younger children (Shan et.al 2023). Another contradictory study suggested that age is a significant predictor of cognitive flexibility indicating that as children grow older, their cognitive flexibility tends to improve (Artamevia et al., 2023).

In case of **educational status of mothers**, results reveal that children of graduate mothers had higher mean value in cognitive development i.e. mean=97.05, SD=8.40 than those of mothers having educational status up to 12th standard (Mean=92.07, SD=7.21) and mothers having educational status up to 10^{th} standard (Mean=89.18, SD=6.33) and also a significant difference was found with F= 46.734, p<.001.

As the primary caretakers in the family, mothers have a significant impact on their children. Mothers with higher levels of education are better able to provide their children with high-quality activities that enhance their home learning environment, scaffold mother-child relationships, and provide more family resources, all of which have an impact on their

intellectual growth. The time spent playing games or solving puzzles, discussing nature or working on scientific projects, building and playing with construction toys, and helping them with arts and crafts is more common among educated mothers. Thus, the finding supported by the study of Siyang (2023) stating that educated mothers are more likely to create a stimulating and enriched home environment that focusses on linguistic or logical skills so that their children may directly interact with the outside world and improve their cognitive abilities. Besides, they can assist their children with schoolwork and guide them academically and helps in reaching educational ambition results in better cognitive performance of children (Akabalieva, 2024; Hanifah et al., 2022).

Regarding **educational status of father,** it was observed that children of fathers with education up to 10^{th} standard had higher mean value i.e. Mean=93.15, SD=8.61 than those of fathers' education up to 12^{th} standard (Mean=92.82, SD=7.89) and graduate fathers (Mean=92.16, SD=7.34). However, no significant difference was observed in mean value of cognitive development.

The results are corroborated by the study of Cano et al., (2019), which suggests that the overall amount of father-child time is connected with increases in children's cognitive functioning irrespective of fathers' education.

Regarding **occupation of father,** results revealed that children of govt./private employee fathers had higher mean value (mean= 93.73, SD=7.84) as compared with fathers who were engaged in business (Mean=92.84, SD=8.29) and daily wage earners (Mean=91.76, SD=7.37). However, there was no significant difference observed in the values of cognitive development.

The result contradicts with other finding of Nguyen & Huu-Luat (2024), stating that fathers' wage employment positively impacts 8-year-old children's cognitive development. Result also contradicts with another study of Nair, 2020 suggesting that a father's occupation may have an effect on his children's cognitive development through several aspects, such as his level of engagement, time availability for child care, and access to resources for stimulating activities and learning opportunities.

Regarding **occupation of mothers,** results revealed that children of homemaker mothers had higher mean value i.e. mean=94.17, SD=8.30, as compared with mothers who were Govt./private employee (mean= 92.90, SD=8.12), mothers who engaged in business (mean=91.20, SD=7.41) and daily wage earners (mean=92.54, SD=7.82). However, there was no significant difference observed in the values of cognitive development.

The result supports by the study of Barg & Klein, (2023) suggesting that there is no significant association between the capabilities of mothers in their particular occupation and the cognitive development of their children in nonverbal skills like spatial awareness and inductive reasoning.

Result contradicts with another study of Yogi, 2023; Stephiana, & Wisan, 2019 stating stating that mothers with non-labour occupations are linked to better cognitive outcomes in their children and also children's cognitive abilities are positively associated with their mothers' employment when they are 7-10 years old.

With respect to **family income**, it was found that the children who belongs to middle income family (RS 50,000-1,00,000) had higher mean value i.e. Mean=98.35, SD=7.15, than those of low-income family (26,000-50,000) where Mean=92.24, SD=7.06 and economically weaker section family (10,000-25000), Mean=90.93 and SD=6.63. There was also significant difference found with $F = 34.434$ and $p < .001$.

Parental ability to invest in educational resources, healthy eating, housing, neighbourhood, and other factors that are essential for children's cognitive development is influenced by family income, which in turn affects the developmental outcomes of children. In fact, a high-income family is better able to provide a dynamic learning environment for their children. A secure and fulfilling upbringing is facilitated by parents being able to afford homes in areas with lower crime rates, access to open spaces, and outstanding educational institutions. Higher-income families can spend money on educational technology, interactive toys, musical instruments, and age-appropriate literature as well as other stimulating materials that promote creativity, and problem-solving in children. The findings are corroborated by Klein & Kuhhirt (2023), who claim that parents with higher incomes may buy more educational resources for their children, such as games, books, toys, and activities that promote cognitive development. Furthermore, early detection and intervention for any cognitive or developmental problems are ensured by having access to high-quality healthcare services, such as routine developmental examinations and mental health support. Moreover, study of Cooper & Stewart, (2021) support the finding stating that higher income result in improved psychological outcomes for parents and favourable parent-child connections that enhance cognitive results, but decreases in income will have a negative impact on cognitive development and negatively affect parental mental health. Thus, family income and cognitive development have a strong association, with children from low-income families exhibiting significantly lower cognitive outcomes than those with higher incomes.

Regarding **number of children,** results revealed that though children in families having two children scored higher mean value (mean=93.16, SD=7.76) than those of three or more children in family (mean=92.73, SD=8.07) and single child family (mean=92.20, SD=7.98), there was no significant difference observed.

The result contradicts by Goisis et al., (2023) stating that only children tend to have similar cognitive scores to children from two-child families and outperform those with two or more siblings. One more study of Saracco (2022), suggested that children with no siblings tend to have better cognition than those with siblings.

In case of **living area,** it was observed that children of urban area had higher mean value (mean=92.99, SD=7.94) as compared with children of semi-urban area (mean=92.33, SD=8.01) and rural area (mean=92.95, SD=7.81). However, there was no significant difference found in cognitive development of children.

The study supported by previous study of Orsholits et al., (2022) stating that growing up in rural areas can lead to long-term cognitive disadvantages in later life, even after considering education and occupation. Urban environments offer more cognitive stimulation opportunities for children's development. One more study revealed that living in urban areas positively impacts cognitive development in children compared to rural areas (Addiniya et al., 2019).

Regarding **game preference** of children, it was also revealed that children who prefer modern games had higher mean value in cognitive development i.e. (mean=95.84, SD=8.95), than those of children who prefer digital games to play (mean=91.73, SD=7.43) and children with traditional game preference (mean=91.39, SD=6.86). There was also significant difference found with $F=18.004$ and $p<.001$.

Modern exploratory educational games offer a range of benefits for children that digital games often lack. A modern game is a form of play in which children use materials and items to create, construct, or explore anything that helps them learn cognitive abilities including problem-solving, critical thinking, spatial awareness, cause-and-effect, and memory and attention. In this constructive play, children set goals, build to achieve them, and learn from their experiences. Studies of Rahmatunisa & Rachmat, (2022), Yang & Lee, (2024) & Aisyah, (2021) support the finding stating that modern constructive games, like block, puzzle, board games significantly enhance cognitive abilities in children including problem solving, memory and creativity, indicating their potential superiority over digital games for cognitive development.

The finding is supported by the study of Huang, (2023) & Baikulova et.al, (2024) stating that negative consequences of digital games include diminished learning capacities, delayed language development, attention memory and problem-solving skills.

4.3 Effectiveness of interventions on Social and Cognitive development of children among control and experimental groups based on Traditional, Modern and Blended games

The results of control group and experimental groups on socio-cognitive development was discussed below. The control group was assessed without providing any intervention, while experimental groups were provided intervention based on Traditional, modern and blended games to find out the effectiveness of the intervention programmes on socio-cognitive development of the children.

Nine traditional games of Assam were chosen for the children of 6-8 years in the experimental group to provide intervention that would enhance their social and cognitive development. These games includes-Luka bhaku, Along dolong, Tekeli bhonga, Ganga rani, Sit pokhila, Kut kut, Aire amar togor, Rumal sur, and Borof and pani each represent vital features that jointly contribute to a child's social and cognitive development. The details of the games were presented in Table 3.1in Methodology chapter.

Regarding modern games intervention, nine modern games were chosen including Ludo, Building Blocks, Jigsaw Puzzle, Checkers, Maze, Crossword Game, Seriation Board Game, Memory Game and Matching Game which were likely to enhance social and cognitive development of children. The details of the games were presented in Table 3.2 in Methodology chapter.

Furthermore, blended games intervention combined the modern and traditional games selected for the first two interventions to offer a distinctive and inclusive approach for children's socio-cognitive development. The purpose of combining both types of games was to establish a strong framework that maximises learning outcomes and enhances socio-cognitive abilities among children.

4.3.1 Levels of Social Development among children in control and experimental groups based on Traditional, Modern and Blended games.

The study also assessed levels of social development in control group as well as experimental groups before and after intervention of Traditional, Modern and Blended games.

The results were analysed with frequency and percentage and discussed under following.

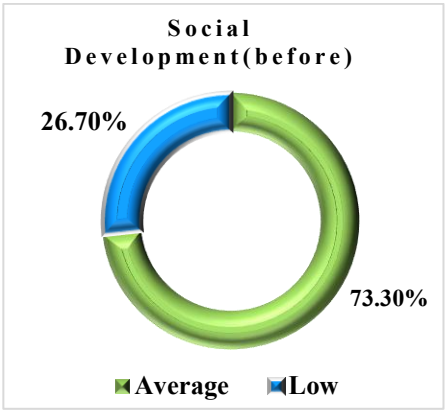

Fig.2 Social Development of children in control group (Before)

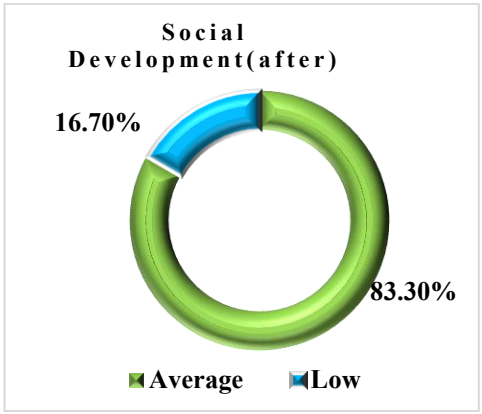

Fig.3 Social Development of children in control group (After)

Figure 2. represents social development of children in control group (Before) phase. From the results, it was observed that majority (73.30%) of the children had average social development, followed by 26.70% who had lower level of social development in the control group before intervention phase.

Similarly figure 3, indicates social development of children in control group (After) phase. Results found that majority (83.30%) of the children in the control group were showing average level of social development and remaining 16.70% had low level of social development which was assessed after intervention phase without providing any intervention. Both figures represents that there was no much difference in their social developments since it was kept under control group to observe the changes.

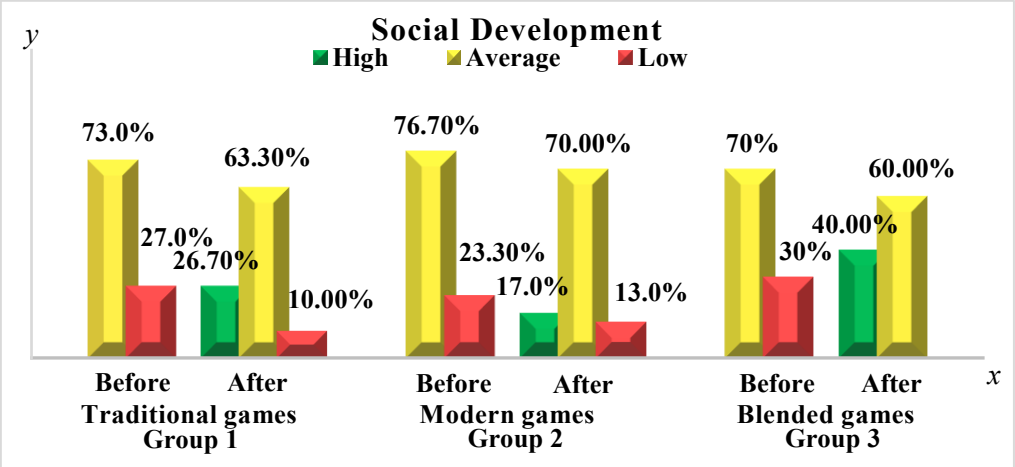

Fig.4 Social Development among children (before and after) under experimental groups based on interventions of Traditional games, Modern games and Blended

Results do not specifically address the control group's development, suggesting that without intervention, changes may be minimal or negligible. Thus, the control group may experience very slight changes in social development.

Figure 4 shows social development among children under experimental groups (before and after) with respect to different interventions.

Traditional games-Experimental group 1:

The results of experimental group 1, under traditional games before intervention, majority (73.0%) of the children were showing average level of social development and remaining 27.0% showed low level of social development. After traditional games intervention, it was noticed that majority i.e. 63.30% of the children showed average level of social development, 26.70% of children are under high and the rest 10.00% showed low level of social development which shows improvements in socialization skills.

Children's social development is the gradual acquisition of the abilities required for building relationships, communicating with others, and understanding societal norms. Traditional games can help children develop social skills by providing opportunities for active participation and interaction while playing in a group. They can assist children in developing their communication skills, cooperation skills and working together towards common goals. These games also enhance social development in children by fostering values like respect, cooperation, honesty, and belongingness. For example, Assamese traditional game "Luka Bhaku" offers an ideal environment for children to learn and grow via sensory engagement. It enhances the listening and rule-following skills that are essential for social interactions and regulated play. It additionally promotes taking turns, which develops tolerance and consideration for the roles played by other players in a game. Additionally, by highlighting the importance of collaboration and teamwork, this game encourages peer engagement. Moreover, children learn cooperation and teamwork in the "Along dolong game" a traditional game of Assam as they cooperate to accomplish shared objectives. Structured communication and cooperative activities in this game also foster interaction skills. Children must solve problems and make choices while playing the game, which fosters the development of critical thinking and strategic decision-making abilities. In fact, another Assamese traditional game "Ganga Rani" fosters active cooperation, teamwork, communication skills, attention, quick decision-making, vocabulary and memory

improvement, and imaginative stimulation among children. Furthermore, assamese traditional game "Aire Amar Togor," enhances verbal and nonverbal communication, which leads to improved interpersonal interactions among participants. It also fosters teamwork and the ability to follow directions, the skills essential for cooperative play and social cohesion. Therefore, following the implementation of traditional games, the social development abilities of the children in experimental group 1 have improved.

This finding is also supported by by Raguan et.al, (2024) & Saefullah et al., (2024) stating that traditional games aid in developing cooperative characters in children by fostering peer interaction, communication skills, teamwork, and responsibility, serving as a valuable forum for personality building in modern times. In addition, traditional games aid in developing children's self-control, encompassing behavioral, as well as decision control, which can positively impact social development among children (Mahfud et al., 2023). Furthermore, traditional games help in enhancing social development in children by fostering self-awareness, responsibility, prosocial behavior, and communication skills through interactive play experiences in a community setting (Astini et al., 2023).

Modern games-Experimental group 2

From the results of figure 4, it was also observed that children of the experimental Group 2, 'before' modern games intervention, majority 76.70%) of the children were showing average level of social development and remaining 23.30% of children were under low level of social development. While, after intervention of modern games, majority (70.0%) of the children had average level of social development, 17.0% showed high level of social development and remaining 13.0% had low level of social development.

Modern games with play materials act as educational games perform well to help children develop socially. Modern educational games create a dynamic and engaging environment that promotes children's well-rounded social development by combining learning and play. For instance, modern game Jigsaw puzzles help children's social development by promoting teamwork, communication, and patience. When children solve puzzles collectively, they learn to share ideas, take turns, and cooperate towards a common objective, so developing cooperative abilities. Discussions on puzzle strategies improve verbal communication and problem-solving skills. Furthermore, group puzzle-solving encourages endurance and resilience, teaching children how to deal with problems and assist

one another. These encounters promote empathy, adaptability, and social bonding, all of which are necessary for negotiating relationships and improved social development. In addition, “Crossword” game played in a group promote teamwork by encouraging children to discuss puzzles, share knowledge, and expand their vocabulary. This cooperative problem-solving technique improves peer interactions, turn-taking, and active listening abilities. Crosswords also encourage patience and resilience, teaching children how to approach obstacles constructively. They also improve language abilities enabling children to successfully express themselves in social situations. Moreover, children learn emotional control and sportsmanship while playing “Ludo” game, which requires them to observe the rules, communicate with their peers, and handle winning and losing gracefully. Children's interpersonal skills are developed through the game's encouragement of verbal interaction, cooperative play, and problem-solving. As players negotiate fairness and competition, Ludo also helps players develop their conflict resolution skills. Thus, modern games provide an engaging environment while assisting children in developing critical social skills in a fun and entertaining way.

The finding is supported by the study of Lin et.al (2024) stating that children enjoy learning through cooperative modern games, enhancing their cooperation thereby by improving social development in line with their learning styles. Similar results of Volynets & Stadnik, (2024); Garaigordobil et al., (2022) found that modern constructive games aid in the social development of children by enhancing communicative competence through partner interaction, sharing, expressing ideas, and describing intentions during collaborative activities.

Blended games-Experimental group 3:

From the figure 4, it was also found that in the experimental group 3, before intervention of blended games, majority (70.00%) of the children showed average level of social development and remaining 30.00% had lower level of social development. While, after intervention of blended games, majority (60.00%) of the children showed average level of social development and remaining 40.00% had higher level of social development. No children showed lower level of social development after intervention.

Traditional games often foster spontaneous social interaction by improving interpersonal behavior, self-related behavior, peer acceptance, and communication skills. While modern games enhance collaboration with learning and play environment as well as

independence among children. The balance of culturally relevant traditional games with modern structured games (blended game) provides a holistic developmental experience, preparing children for varied social situations.

Children's social development is greatly aided by traditional games since they instill cultural norms and social values into play. By encouraging collaboration, effort, and adherence to rules, these games foster vital social skills. For example, “Tekeli Bhonga" and “Rumal sur” game motivate children to take turns and actively participate in group activities and encourage feelings of togetherness. Moreover, in “Kutkut” game children learn patience, taking turns, and resolving conflicts via shared experiences, which assist improving their social skills. In addition to transmitting cultural legacy, traditional games strengthen individual's sense of self and community. For instance, in “Along dolong” game, cooperation and team spirit are established among children as they work together to achieve common goals, and interaction skills are promoted through structured communication and collaborative exercises. Furthermore, “Ganga Rani” game, in addition to fostering problem-solving and strategic thinking, improve peer connections and communication skills and also promote active cooperation and develop team spirit by engaging in folk rhymes encouraging cultural values. Thus, within the cultural context, traditional games offer a comprehensive approach to children's social development by incorporating moral and social lessons.

Furthermore, by combining play materials, engaging settings, and peer interaction, modern games offer a comprehensive learning opportunity for children. For instance, “Checkers board” game, as a multiplayer game, encourages communication, patience, and taking turns, which helps children develop important social skills like cooperation and sportsmanship. Players compete peacefully, negotiate moves, and learn how to handle both success and failures appropriately. Additionally, cooperative “Jigsaw puzzle” game promotes social connection by promoting turn-taking, communication, and teamwork. Children learn patience, how to negotiate, and how to recognise common objectives as they cooperate to find pieces. In addition to strengthening social-emotional abilities like empathy and cooperation, this cooperative effort fosters peer engagement. Additionally, playing “Memory” and “Matching” card games in a group environment promotes cooperation, communication, and taking turns among children. They acquire problem-solving techniques through peer interaction, negotiation, and shared experiences as they face difficulties when completing memory-based tasks. So, intervention of combination of traditional and modern games (Blended game) helps children by encouraging them to engage in joint activities and

fostering collaboration not only promotes social interaction but also allows children to learn from one another, combining the strengths of both types of games. Thus, combining traditional games with modern elements (blended game) enhances children's interpersonal behaviour, communication, peer acceptance, teamwork, cultural pride and endurance, offering a holistic approach to social development (Munir et al., 2024; Harahap, 2023).

4.3.2 Levels of Cognitive Development among children in control and experimental groups based on Traditional, Modern and Blended games

The study also assessed levels of cognitive development in control group as well as experimental groups before and after intervention of Traditional, Modern and Blended games. The results were analysed with frequency, percentage and discussed below.

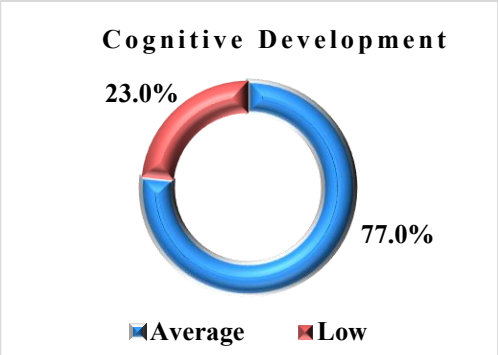

Fig. 5 Cognitive Development of children in control group (Before)

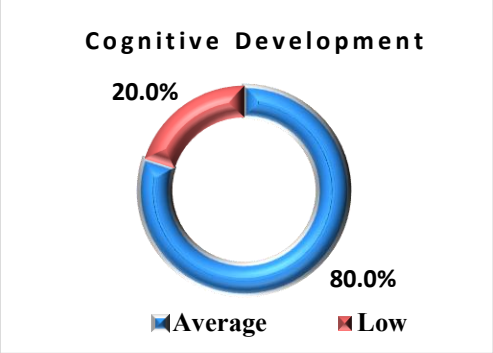

Fig. 6 Cognitive Development of children in control group (After)

Results of the Figure 5 reveals that majority (77.0%) of the respondents in the control group showed average cognitive development and 23.0% have lower level of cognitive development before intervention phase.

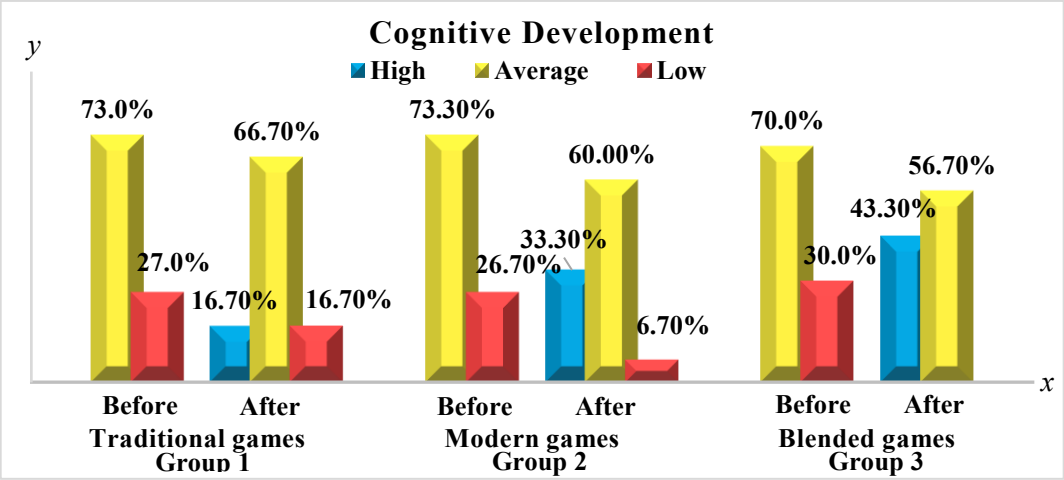

Fig. 7 Cognitive Development among children (before and after) under experimental groups based on interventions of Traditional games, Modern games and Blended games

On the other hand, results of the Figure 6 depict that majority (80.0%) of the respondents of the control, group had average cognitive development and 20.0% had lower level of cognitive development after intervention phase.

Traditional games-Experimental group 1

Results of the figure 7 reveals that in the experimental group 1, majority (73.0%) of the respondents found to be in average cognitive development and 27.0% showed lower level of cognitive development before providing traditional games intervention. On the other hand, it is evident to observe that majority (66.70%) of the respondents found to be in average cognitive development, where equal number of respondents i.e. 16.70% were under low as well as high level of cognitive development after providing traditional games intervention.

Children's cognitive development is a vital component of human growth that influences how they think, learn, and engage with the outside world. It includes a number of mental functions, such as thinking, memory, perception, problem-solving, and language acquisition.

Playing traditional Assamese games helps children develop cognitive skills by improving their memory, spatial awareness, critical thinking, and problem-solving abilities. For example, “Along dolong” game requires children to solve problems and make decisions, helping them develop critical thinking and strategic decision-making skills. Children's working memory, spatial awareness, and problem-solving abilities are all improved by playing “Luka Bhaku” game. On the other hand, in “Tekeli bhonga” traditional game, children learn how to solve problems as they plan how to hit the pot while staying balanced and coordinated. This game enhances hand-eye coordination and spatial awareness, two skills essential to cognitive development. As players must maintain concentrate on their goal while overcoming hurdles, it also improves concentration. Through "Sith Pokhila," traditional game children increase their object identification accuracy and learn many concepts about their surroundings. Moreover, while playing “Kutkut” traditional game, children must count numbers, memorise sequences, and plan their motions in order to play the game, which improves their working memory and numerical abilities. The traditional game “Borof aru pani” improves focus, decision-making, and problem-solving abilities, which has major cognitive benefits. Players must swiftly evaluate their surroundings, plan escape routes, and adjust to shifting play dynamics in this fast-paced pursuit game, promotes cognitive flexibility. Working memory is also strengthened by having to recall teammates' statuses,

whether they are frozen or unfrozen and reversibility concepts-such as ice and water are also improves. Thus, these culturally rooted games offer a whole developmental experience that combines mental stimulation with physical exercise and emotional strength, all of which are essential for overall intellectual development of children.

The finding is supported by the study of Gul, (2023) stating that children's cognitive development is greatly enhanced by traditional games. This finding is also supported by the study of Alvisari et.al (2024) suggesting that traditional games have been shown to enhance numeracy and analytical skills among young children, demonstrating notable improvements in cognitive abilities and concentration levels. Similarly, research indicates that traditional games can effectively enhance cognitive development in children by improving their abilities by stimulating logical thinking, symbolic reasoning, memory retention, concentration and communication skills Matura et.al, 2024; Astini et.al 2023).

Modern games-Experimental group 2

Results of the figure 7 also indicates that that majority (73.30%) of the respondents of the experimental group 2, were in average level of cognitive development and 26.70% had lower level of cognitive development before providing modern games intervention. Whereas, majority (60.0%) of the respondents in the experimental group 2, were in average level of cognitive development and 33.30% had high level of cognitive development and remaining 6.70% were found to be in low level of cognitive development after providing modern games intervention.

Children's cognitive development is greatly aided by modern games with play materials, which improve creativity, spatial awareness, logical reasoning, and problem-solving skills. for instance, Jigsaw puzzles, building Blocks, and board games like Ludo, Checkers are examples of activities that promote cognitive flexibility by requiring critical thinking, pattern recognition, and memory retention. Strategic thinking, planning, and decision-making are enhanced by interactive games like crossword games, mazes etc. with well-defined rules. Furthermore, Seriation board games improve logical reasoning, sequencing, and problem-solving skills and also foster fine motor abilities and creativity, encouraging sensory-motor integration. Thus, modern games foster fundamental cognitive functions that are essential for general intellectual development by offering experiential learning opportunities.

The findings supported by Vita-Barrull et al., (2023), Alexandra et al., (2022) & Artamevia et al. (2023) stating that playing modern games improves executive skills including working memory, inhibition, and cognitive flexibility, logical thinking, problem-solving skills, symbolic function, attention, imagination, cooperation abilities in children.

Blended games-Experimental group 3:

Figure 7 also revealed that majority (70.0%) of the respondents in the experimental group 3, were in average level of cognitive development and 30.0% were in lower level of cognitive development before providing blended games intervention. On the other hand, majority (56.70%) of the respondents in the experimental group 3, were in average level of cognitive development and remaining 43.30% were found to be in high level of cognitive development after providing blended games intervention. No children were found in lower level of cognitive development after the blended games intervention.

Games are incredibly crucial for children's development since they help them grow holistically. Traditional games teach cultural values through interactive play experiences, honesty, teamwork, responsibility, fostering critical thinking, cooperation as well as problem solving skills skills. For instance, “Along dolong”, “Ganga rani”, “Aire amar togor “games help children learn communication skills through verbal and non-verbal cues, promotes cooperation, encourage information processing, critical thinking and problem-solving skills among children. The finding is supported by study of (Gul, 2023) stating that playing traditional games with children promotes their cognitive and personality development in a healthy way. Whereas, modern games enhance cognitive development by combining learning elements with the environment making it conducive for children and fosters creativity, logical reasoning, memory problem solving as well as concentration skills. For example, jigsaw puzzles game improves creativity, spatial reasoning, problem-solving abilities, logical reasoning and attention span. Children's fine motor abilities and hand-eye coordination also improve as they work with puzzle pieces.

This study is supported by Maharani et al. (2022) stating that modern games can help children become more creative by allowing them imagine, explore, and engage in activities that encourage better learning and creative thinking while also allowing them to reach their full potential. Since, both the traditional and modern games are beneficial for children in their own way, the combination of those games (blended games) often incorporate cultural values and educational elements providing rich environment that support comprehensive cognitive

development in children by promoting memory, information processing, critical thinking, problem-solving skills in children.

4.3.3 Social Development and its dimensions in experimental and control group before and after intervention of Traditional games

The effect of intervention programmes based on traditional games, modern games and blended games on social and cognitive development of children (6-8 years) are discussed below.

For the experimental group 1, assessment of social development among children was done before and after intervention of traditional games. The intervention was planned for three months, with two sessions in a week. The session introduced total of nine traditional Assamese games including- Luka bhaku, Along dolong, Tekeli bhonga, Ganga rani, Sit pokhila, Kut kut, Aire amar togor, Rumal sur, and Borof and pani. In each session one traditional game was introduced to children with 60 minutes per session. All the session were completed with repetition of these 9 traditional games and after assessment of before and after was taken. The results based on various dimensions like self-help general, self-help eating, self-help dressing, self-direction, occupation, communication, locomotion as well as social development are discussed below.

Table 10 demonstrates social development and its related dimensions in experimental and control group before and after intervention of traditional games. Results showed that following the traditional game intervention, there was a statistically significant difference between the control and experimental group 1 in the areas of Self-help general (Mean=,97.00, SD=4.18), Self-help eating (Mean=96.94, SD=4.72), Self-help dressing (Mean=96.41, SD=3.40), Self-direction (Mean=97.41, SD=4.73), and Occupation (Mean=97.48, SD=4.41). The Cohen's *d* values of 0.57, 0.51, 0.51, 0.55 and 0.57 respectively indicates medium effect size of Traditional games intervention in those areas of development in children. Additionally, in the dimensions of Communication (Mean=98.05, SD=5.08) and Locomotion (Mean=99.25, SD=4.93) a significant difference was found and the effect size of Traditional games were found to have large effect size with Cohen's *d* values of 0.81 and 0.80 respectively. Additionally, children in experimental group 1 and the control group showed a significant difference in their Social development (Mean=98.89, SD=6.87); the experimental group 1's Cohen's d value of 0.81 indicated a larger effect size of the Traditional game intervention among children.

Table 10: Social Development and its related dimensions in Experimental and Control group before and after intervention of Traditional games

Dimensions	Control group (N=30) Groups	Mean	SD	t-value	Experimental group (N=30) Mean	SD	t-value *p* value	Cohens *d*
Self-help general	Experimental	92.35	4.89	-0.04^{NS}	97.00	4.18	2.54	0.57
	Control	92.41	4.81		94.41	4.79	0.01*	
Self-help eating	Experimental	93.00	5.00	-0.02^{NS}	96.94	4.72	2.27	0.51
	Control	93.02	5.05		94.46	4.92	0.02*	
Self-help dressing	Experimental	94.53	3.85	.058 ^{NS}	96.41	3.40	2.28	0.51
	Control	94.48	3.99		94.48	3.99	0.02*	
Self-direction	Experimental	93.33	5.25	0.04 ^{NS}	97.41	4.73	2.42	0.55
	Control	93.28	5.36		94.61	5.41	0.01*	
Occupation	Experimental	93.71	5.15	0.17 ^{NS}	97.48	4.41	2.52	0.57
	Control	93.51	5.18		94.74	5.15	0.01**	
Communication	Experimental	90.46	7.91	-0.04 ^{NS}	98.05	5.08	3.60	0.81
	Control	90.53	7.68		92.74	7.66	0.001**	
Locomotion	Experimental	93.38	5.57	-0.27 ^{NS}	99.25	4.93	3.54	0.80
	Control	93.74	6.05		95.12	5.35	0.001**	
Social development	Experimental	90.76	8.04	0.19 ^{NS}	98.89	6.87	3.62	0.81
	Control	90.41	8.05		92.79	7.97	0.001**	

***Significant at 5% level, **Significant at 1% level, NS-non significant**

Traditional games foster social skills like interaction with peers, following rules, enhance self-control, and instill cultural values, which are essential for personal growth. These games help children establish a sense of community belonging and interpersonal competence, which in turn helps them build self-esteem, autonomy, and independence. For instance, children play the traditional Assamese game “Ganga Rani” by singing folk rhymes based on stories that have been passed down through the years and are culturally significant. They improve their vocabulary and verbal expression while also learning about local folklore through this practice. The conversational aspect of the rhymes encourages participants to share their opinions, build peer connections, and participate in storytelling collectively, which contribute to their communication skills and overall social development. Additionally, children learn important skills through the "Along dolong" game, like cooperation and teamwork, which are developed when they cooperate to accomplish common goals and interaction skills are promoted through structured communication and collaborative exercises. Additionally, it facilitates group play, which helps children develop their gross motor skills

and improve their locomotion skills. Moreover, the traditional game, "Aire Amar Togor," improves both nonverbal and verbal interaction, resulting in better communication skills among the participants. It also promotes cooperation and the ability to follow directions because each player is accountable for the team's success. Children start the "Sit pokhila" game with a rhythmic conversation that challenges their awareness of their surroundings and requires mobility throughout the game in order to win. This helps children improve their communication skills and their locomotion ability. The “Luka Bhaku” games also improve children's ability to move by promoting running, crawling, climbing, and rapid direction changes which enhance balance, agility, gross motor coordination, and spatial awareness, all of which improve locomotion skills. Moreover, “Kutkut” game improves children's ability to move by encouraging balance, coordination, and deliberate body motions. Children gain muscular strength, agility, and spatial awareness when they hop, jump, and shift their weight from one foot to another resulting in improved locomotion skills. The “Rumal sur” game helps children develop their gross motor skills by encouraging running, agility, balance, and coordination and also improve their reflexes, muscular strength, and spatial awareness as they pursue and avoid opponents. Children's gross motor skills are also improved by the "borof aru pani" game, which promotes running, dodging, and rapid direction changes. These exercises enhance muscular strength, balance, coordination, and general physical agility, all of which support locomotor abilities. Furthermore, traditional games help children become more independent by promoting self-directed play, problem-solving, and decision-making. Children gain independence and confidence as they follow the rules, take charge, and play parts in the game. This cultivates a sense of accountability and self-control, which are necessary for autonomous functioning in social and personal contexts resulting in improvement of self-help eating, self-help dressing, self-direction, and occupation skills.

The finding is supported by the study of Krishnaveni & Shahin (2022) and Korlefura et al., (2020) stating that engaging in traditional games aids children in self-control, encompassing behavioral control which in turn contribute positive social skills among children. Further, traditional games encourage decision-making and problem-solving which are essential components of autonomy (Mahfud et al., 2023). Similarly other study revealed that traditional games aid in enhancing children's locomotor skills, improving body coordination and balance (Munir et al., 2024). Accordingly, traditional games can have a positive impact on a number of areas of children's social development, such as self-help general, self-help dressing, self-help eating, engagement with others, self-regulation of

behaviours, socialisation, locomotion and occupation (Khaton et al., 2024). Hence, the null hypothesis H_o3- There is no significant difference on social development among children in control and experimental groups with respect to Traditional games is rejected.

4.3.4 Social Development and its dimensions in experimental and control group before and after intervention of Modern games

For the experimental group 2, assessment of social development among children was done before and after intervention of modern games. The intervention was planned for three months, with two sessions in a week. The intervention introduced total of nine modern games including- Jigsaw puzzle, Checkers board game, Maze, Crossword game, Seriation board game, Memory game, Matching game, Building blocks game and Ludo game. In each session one modern game was introduced to children with 60 minutes per session. All the sessions were completed with repetition of these 9 modern games and after assessment of before and after was taken. The results based on various dimensions like self-help general, self-help eating, self-help dressing, self-direction, occupation, communication, locomotion as well as social development are discussed below.

Table 11: Social Development and its related dimensions in Experimental and Control group before and after intervention of Modern games

	Before (N=30)				After (N=30)			
Dimensions	**Group**	**Mea**	**SD**	**t-value**	**Mean**	**SD**	**t-value p value**	**Cohens *d***
Self-help general	Experimental	92.43	4.50	0.02^{NS}	96.69	4.07	2.26	0.51
	Control	92.41	4.81		94.41	4.79	0.02*	
Self-help eating	Experimental	93.30	5.25	0.24^{NS}	96.76	4.84	2.08	0.47
	Control	93.02	5.05		94.46	4.92	0.04*	
Self-help	Experimental	94.35	4.49	-0.13^{NS}	96.23	4.10	2.04	0.46
dressing	Control	94.48	3.99		94.48	3.99	0.04*	
Self-direction	Experimental	93.15	4.76	-0.11^{NS}	98.53	4.26	3.55	0.80
	Control	93.28	5.36		94.61	5.41	0.001**	
Occupation	Experimental	93.79	4.73	0.25^{NS}	98.58	4.39	3.54	0.80
	Control	93.51	5.18		94.74	5.15	0.001**	
Communication	Experimental	90.82	5.92	0.18^{NS}	95.82	5.54	2.03	0.46
	Control	90.53	7.68		92.74	7.66	0.04*	
Locomotion	Experimental	93.89	4.75	0.12^{NS}	96.87	4.57	1.54	0.35
	Control	93.74	6.05		95.12	5.35	0.12^{NS}	
Social	Experimental	90.61	7.21	0.11^{NS}	97.43	6.36	2.84	0.64
development	Control	90.41	8.05		92.79	7.97	0.006**	

***Significant at 5% level, **Significant at 1% level NS=Not Significant**

Table 11 represents social development and its related dimensions in experimental and control group before and after intervention of modern games. Results showed that there was a significant difference between the experimental group 2 and the control group in the areas of Self-help eating (Mean=96.76, SD=4.84), Self-help dressing (Mean=96.23, SD=4.10), Communication (Mean=95.82, SD=5.54), and Locomotion (Mean=96.87, SD=4.57) where the Cohen's *d* values were 0.47, 0.46, 0.46 and 0.35 respectively which indicates small effect size of Modern games intervention on those areas of children. Additionally, there was a significant difference between experimental group 2 and the control group in terms of Self-help General (Mean=96.69, SD=4.07) and Cohen's *d* value was found to be 0.51 indicating medium effect size of Modern games intervention. In case of Self-direction (Mean=98.53, SD=4.26) and Occupation (Mean=98.58, SD=4.39), the mean value of experimental group 2 was significantly different from control group and the Cohen's *d* values were equal for both the dimensions that is 0.80 meaning a high effect size of Modern games intervention. Additionally, there was statistically significant difference in Social development (Mean=97.43, SD=6.36) between the control group and the experimental group 2 where Cohens *d* value was 0.64 which indicates a medium effect size of Modern games on Social development of the children.

Modern games are distinct from other activities like working and learning since they are carried out with the intention of achieving certain goals. While playing modern games, children use their brains and stimulate their senses in order to explore their surroundings. Furthermore, the games promote cognitive development as well as social interaction skills. for instance, children who play "Ludo" game they must individually plan their moves while following the rules. They improve problem-solving skills by evaluating risks and predicting outcomes as they overcome obstacles. Children's task organisation abilities are improved by the game's structure, which requires them to prioritise token movement, plan their activities, and adjust to the strategies of their opponents. Making decisions on their own and taking lessons from the results also improves resilience all of which contributes self-direction skills of children. Moreover, children must remain involved in the game for several turns, which fosters patience and focus. They acquire the ability to efficiently process and carry out sequential tasks by following defined rules and directions. Furthermore, having to plan ahead and wait for their time encourages self-control and perseverance, two qualities necessary for finishing tasks. Ludo's goal-oriented and interactive features encourage children to stay motivated and involved in activities and thus helps in developing occupation skills among

children. Moreover, building "Block" "Mazes", and "Jigsaw puzzles" encourage children to solve problems with a purpose, which improves occupational and self-direction skills. Planning, endurance, and patience are necessary for these activities, which encourage self-control and autonomous decision-making. Children acquire spatial reasoning and critical thinking skills as they examine patterns, find answers, and adapt their strategies. In addition to improving task organisation and attention to detail, the process of trial and error fortifies persistence and flexibility. Additionally, "Checkers" board game encourages children to autonomously create and carry out plans, which helps them develop self-direction and occupational skills. As players anticipate moves and adjust to shifting situations, the game improves attention, task perseverance, and decision-making. Additionally, it fosters goal-setting and patience which are necessary for successfully and independently finishing prescribed activities. Conversely, modern games such as "Memory" game, "Matching" game, "Crossword" "Jigsaw puzzles", "Mazes", "Seriation" "Ludo" and "Checkers" games are mostly activities that require little to no physical exertion. Instead of promoting gross motor skills, these games emphasise mental skills including creativity, reasoning, problem-solving, sequencing, and memory. They do not substantially aid in locomotor development such as running, leaping, or other physical activities that improve muscle strength, coordination, and endurance because they are usually played while seated and involve little bodily movement resulting in minimal improvement in locomotion skills. Moreover, "Seriation", "Maze" "Jigsaw puzzle" games mostly concentrating on mental processes, thus offer little opportunity for use of verbal language among children. Instead of substantial verbal exchange, there may be less communication, typically restricted to sharing or explaining rules. As a result, even if communication skills of children improve, there may not be a large improvement. Additionally, "Ludo", "Checkers", "Memory" games, "Matching" game and "Crossword" game foster peer contact, cooperative play, and communication, all of which contribute to social development. Children learn empathy, cooperation, and conflict resolution techniques through these games, which require turn-taking, rule-following, and decision-making. Children develop their interpersonal abilities through these regulated social interactions, which enhances their emotional competency and social development. The finding is supported by the study of (Bush, 2019) stating that children who engage in modern exploratory game demonstrate improved conceptual understanding and cooperation in social dilemmas, enhancing decision-making, task completion, and rule-following skills. Piaget highlights the way in which children organise their knowledge and asserts that learning can

only occur through interaction with the environment and mental processes, not by external instruction (Adak-Ozdemir & Kocyigit, 2019; Tugrul, 2016). Furthermore, these games create engaging environments that foster collaboration and learning, simulate real-world dilemmas, allowing players to practice decision-making in a safe environment. Hence, H_o4- There is no significant difference on social development among children in control and experimental groups with respect to Modern games is rejected.

4.3.5 Social Development and its dimensions in experimental and control group before and after intervention of Blended games

The social development of children was examined before and after a three-month intervention with blended games in the experimental group 3. The intervention provided children to nine traditional Assamese games: Luka bhaku, Along dolong, Tekeli bhonga, Ganga rani, Sit pokhila, Kut kut, Aire amar togor, Rumal sur, and Borof and pani. In addition, the intervention includes nine modern games: Jigsaw puzzle, Checkers board game, Maze, Crossword game, Seriation board game, Memory game, Matching game, Building block and Ludo game. Each week, two sessions were held, one for a traditional game and one for a modern game, each lasting 60 minutes and the results based on various dimensions like self help general, self-help eating, self-help dressing, self-direction, occupation, communication, locomotion as well as social development are discussed below.

Table 12 displays Social Development and its related dimensions in experimental and control group before and after intervention of blended games. Results revealed that there was a significant difference between the experimental group 3 and the control group in the areas of Self-help dressing (Mean=97.48, SD=4.68) and Self-help eating (Mean=97.76, SD=4.37) where the Cohen's *d* values were 0.70 and 0.68 respectively which indicates medium effect size of Blended games intervention on those particular areas in children. Furthermore, there was a statistically significant difference between the experimental group 3 and the control group in the domains of Self-help general (Mean=98.66, SD=5.35), Self-direction (Mean=98.43, SD=4.02), Occupation (Mean=98.56, SD=4.17), Communication (Mean=98.05. SD=5.03) and Locomotion (Mean=99.23, SD=4.80) and the Cohen's *d* values were 0.83, 0.80, 0.81, 0.81 and 0.80 respectively indicating large effect size of Blended games intervention in those areas among children. Moreover, a statistically significant difference in Social development (Mean=99.69, SD=6.24) was seen between the experimental group 3 and the control group.

Table 12: Social Development and its related dimensions in Experimental and Control group before and after intervention of Blended games

Dimensions	Groups	Before (N=30) Mean	SD	t-value	After (N=30) Mean	SD	t-value p value	Cohens *d*
Self-help general	Experimental	92.64	4.82	0.21^{NS}	98.66	5.35	3.69 0.001**	0.83
	Control	92.41	4.81		94.41	4.79		
Self-help eating	Experimental	93.05	4.41	0.02^{NS}	97.76	4.37	3.13 0.002**	0.70
	Control	93.02	5.05		94.46	4.92		
Self-help dressing	Experimental	94.17	5.98	-0.29^{NS}	97.48	4.68	3.04 0.003**	0.68
	Control	94.48	3.99		94.48	3.99		
Self-direction	Experimental	93.17	5.28	-0.08^{NS}	98.43	4.02	3.53 0.001**	0.80
	Control	93.28	5.36		94.61	5.41		
Occupation	Experimental	93.53	4.87	0.02^{NS}	98.56	4.17	3.59 0.001**	0.81
	Control	93.51	5.18		94.74	5.15		
Communication	Experimental	90.51	4.74	-0.01^{NS}	98.05	5.03	3.61 0.001**	0.81
	Control	90.53	7.68		92.74	7.66		
Locomotion	Experimental	93.82	5.34	0.05^{NS}	99.23	4.80	3.56 0.001**	0.80
	Control	93.74	6.05		95.12	5.35		
Social Development	Experimental	90.30	6.12	-0.06^{NS}	99.69	6.24	4.25 0.001**	0.96
	Control	90.41	8.05		92.79	7.97		

****Significant at 1% level, NS=Not Significant**

Traditional games have been shown to have significant benefits for children's social development. These games help children develop their social skills and communication abilities by promoting verbal interaction, teamwork, and turn-taking. For example, traditional Assamese game “Tekeli Bhonga” helps children develop their social skills and communication abilities by promoting cooperation, verbal coordination, and strategic planning. It encourages peer engagement and improves cooperation, turn-taking, and active listening. In addition, “Ganga Rani” game enhances peer relationships and communication abilities by using folk melodies that uphold traditional values and also encourages active cooperation and teamwork. Additionally, the "Along dolong" game teaches children valuable communication skills. Children also acquire collaboration and teamwork when they work together to achieve shared objectives, and structured communication and cooperative

activities help them develop these abilities. Additionally, the traditional game, "Aire Amar Togor," enhances verbal and nonverbal contact, which helps participants communicate more effectively. Because every player is responsible for the team's performance, it also fosters collaboration and the capacity to follow instructions resulting in better socialization among children. They also help children develop empathy, cooperation, and conflict resolution skills, which give them the chance to build relationships and learn social cues. Moreover, through word association, spelling, and vocabulary expansion, the modern game “Crossword” game advances children's communication abilities and fosters social development through peer contact, teamwork, and collaboration. In addition, “Ludo”, and “Checkers” teach risk assessment and strategic planning, which enhances flexibility, decision-making, and task organisation. It cultivates perseverance, self-control, patience, and focus. Since, these games are goal-oriented, it keeps children interested while encouraging self-direction and occupational skills that are necessary for finishing tasks and achieving long-term objectives. Furthermore, building “Block” “Mazes”, “Seriation” and “Jigsaw puzzles” encourage children to solve problems with a purpose, which improves occupational and self-direction skills. Planning, endurance, and patience are necessary for these activities, which encourage self-control and autonomous decision-making. Children acquire spatial reasoning and critical thinking skills as they examine patterns, find answers, and adapt their strategies. In addition to improving task organisation and attention to detail, the process of trial and error fortifies persistence and flexibility and thus children may improve self-help general, self-help eating as well as self-help dressing skills. Children's locomotor skills are greatly improved by traditional games like ‘Kutkut”, Borof aru pani”, “Rumal sur” and “Sit pokhila” which encourage active movement and physical coordination. Running, jumping, hopping, evading, and abrupt direction changes are all part of these traditional games which enhance gross motor control, balance, and agility. Kutkut, which involves repeatedly hopping on one or both feet, specifically improves leg strength and coordination. By chasing and dodging, the “Borof aru pani”, “Rumal sur” and “Sit pokhila” game helps players improve their speed, stamina, and spatial awareness. In addition, these exercises promote rhythm and body awareness, both of which are necessary for effective movement. The “Luka Bhaku” games also improve children's ability to move by promoting running, crawling, climbing, and rapid direction changes which enhance balance, agility, gross motor coordination, and spatial awareness, all of which improve locomotion skills. Thus, after providing blended games intervention better improvement in all the areas including social development of children were observed. The

findings supported by the study of Yatmaz et al., (2021), Wahyuningtyas & Noer (2024) stating that traditional games can enhance children's self-confidence, communication skills, cooperation, cohesion, discipline, and empathy. They also improve motor skills, body coordination, and social skills like cooperation and communication (Munir et al., 2024). Similarly, modern games contribute to children's overall development by supporting psychomotor, language, social-emotional, and self-care skills. These games combine learning elements with creative activities, fostering creativity and problem-solving abilities in children and helps in improve social interaction skills (Dwiredy & Qalbi, 2021; Kovalevska & Pasichnichenko, 2022). Thus, combining traditional games with modern games (blended games) provides a balanced approach to improving children's social development across all domains. Hence, the null hypothesis $H_{\circ}5$- There is no significant difference on social development among children in control and experimental groups with respect to Blended games is rejected.

4.3.6 Cognitive Development and its dimensions in experimental and control group before and after intervention of Traditional games

For the experimental group 1, assessment of cognitive development among children was done before and after intervention of traditional games. The intervention was planned for three months, with two sessions in a week. The session introduced total of nine traditional Assamese games including- Luka bhaku, Along dolong, Tekeli bhonga, Ganga rani, Sit pokhila, Kut kut, Aire amar togor, Rumal sur, and Borof and pani. In each session one traditional game was introduced to children with 60 minutes per session. All the session were completed with repetition of these 9 traditional games and assessment of before and after was taken. The results based on various dimensions like Information, Comprehension, Arithmetic, Similarity, Vocabulary, Digit span, Picture completion, Block, Object assembly, Coding, Maze as well as Cognitive development are discussed under following. The control group was also assessed at the same time, with no intervention, and the differences between the control group and experimental group 1 are addressed below.

Table 13: Cognitive Development and its dimensions in Experimental and Control group before and after intervention of Traditional games

Before (N=30)					After (N=30)			
Dimensions	**Groups**	**Mean**	**SD**	**t value**	**Mean**	**SD**	**t value *p* value**	**Cohens *d***
Information	Experimental	88.76	17.48	-.06 NS	102.87	13.27	3.56	0.80
	Control	89.00	17.15		90.48	17.17	0.001**	
Comprehension	Experimental	98.02	15.07	-0.02 NS	110.76	11.96	3.55	0.80
	Control	97.94	15.14		100.02	14.58	0.001**	
Arithmetic	Experimental	89.97	19.82	0.04 NS	99.48	15.13	2.30	0.52
	Control	89.76	18.80		91.48	15.47	0.02*	
Similarity	Experimental	98.69	16.43	-0.01 NS	103.76	16.09	1.15	0.26
	Control	98.74	16.91		99.53	16.24	0.25NS	
Vocabulary	Experimental	70.33	10.54	-0.22 NS	80.53	10.18	3.48	0.80
	Control	70.87	10.40		72.30	10.67	0.001**	
Digit span	Experimental	86.00	9.84	-0.17 NS	92.05	9.24	2.06	0.46
	Control	86.38	9.62		87.66	9.55	0.04*	
Picture	Experimental	85.58	15.56	0.02 NS	93.61	13.44	2.03	0.46
completion	Control	85.51	15.80		86.87	15.76	0.04*	
Block	Experimental	97.15	13.81	0.04 NS	104.89	10.75	2.08	0.47
	Control	97.02	13.64		98.64	13.58	0.04*	
Object assembly	Experimental	92.15	15.87	0.14 NS	100.58	13.68	2.31	0.52
	Control	91.61	16.53		92.66	16.40	0.02*	
Coding	Experimental	106.53	13.04	0.10 NS	111.28	12.93	1.20	0.27
	Control	106.23	12.99		107.82	12.47	0.23NS	
Maze	Experimental	93.82	9.44	-0.01 NS	97.25	9.11	1.19	0.27
	Control	93.84	9.32		94.76	9.24	0.23NS	
Overall	Experimental	91.82	8.59	0.04 NS	98.48	6.67	2.92	0.66
Cognitive	Control	91.74	6.36		93.83	7.33	0.04*	
Development								

*Significant at 5% level, **Significant at 1% level, NS= Not Significant

Table 13 represents cognitive development and its dimensions in experimental and control group before and after intervention of Traditional games**.** The results revealed significant differences between the experimental group 1 and control groups in the areas of Information (Mean=102.87, SD=13.27), Comprehension (Mean=110.76, SD=11.96), and Vocabulary (Mean=80.53, SD=10.18) with Cohen's d values of 0.80 in all three areas, indicating a large effect size of the traditional games intervention. Additionally, in the areas of Arithmetic (Mean=99.48, SD=15.13) and Object assembly (Mean=100.58, SD=13.68), statistically significant differences were found, with Cohen's d values of 0.52 for both areas, suggesting a medium effect size. In case of Picture completion (Mean=93.61, SD=13.44) and Block (Mean=104.89, SD=10.75), significant differences were observed, with Cohen's d values of 0.46 and 0.47, respectively, indicating a small effect size. Furthermore, there was no statistically significant difference in the area of Similarity (Mean=103.76, SD=16.09), with a Cohen's d value of 0.26. Similarly, for Coding (Mean=111.28, SD=12.93) and Maze (Mean=97.25, SD=9.11), Cohen's d values were 0.27, indicating a small effect size of Traditional games in these areas. Overall, a significant difference in Cognitive development (Mean=98.48, SD=6.67) was found between the experimental and control groups, with a Cohen's d value of 0.66, indicating a medium effect size of the traditional games' intervention on children's cognitive development.

The environment has a great influence in supporting children's growth and development. Children will imitate and learn from the surrounding environment. During traditional games, children like and dare to be explored various topics in a play group. These games help to acquire knowledge and skills so that children can develop their potential and talents while socializing with the community and achieve their learning goals. For instance, traditional game "Sit pokhila", enhances listening skills, ability to follow commands, problem-solving abilities, and quick replies. Children also become more accurate in identifying objects, learn a lot of knowledge about their environment, and develop their attention span. Moreover, the "Tekeli Bhonga" game encourages children to actively engage in activities that increase their awareness of their environment and foster sensory learning and spatial awareness and thus these games might help children to perform better in the area of information skills through active participation in the environment and better acquisition of knowledge. The games "Aire amar togor", "Ganga rani", and "Along dolong" promote group engagement, which improves peer connections and communication skills. These games help players communicate more effectively by encouraging both verbal and nonverbal cues. As

they participate in rich verbal conversations, children may therefore develop their vocabulary as well as comprehension skills. Moreover, “Kutkut” games incorporates number recognition, counting, and sequencing and can assist children improve their arithmetic skills. Children practise mental maths and numerical order as they hop over numbered grids. The game fosters fundamental math ideas in an interesting, hands-on learning setting while also improving problem-solving and spatial awareness. The “Borof aru pani” game help children with the development of quick decision-making abilities. Through this game children not only learn to think critically and adapt to changing situations but also improves their concentration. The “Luka bhaku” game demands that players use cognitive abilities like spatial reasoning, prediction, and adaptation in addition to strategic thinking and decision-making. The “Borof aru pani” game also improve logical thinking of children by encouraging problem-solving, pattern recognition, and cause-and-effect understanding. Thus, through these playful experience children might improve object assembly skills.

The finding supported by the study of Alvisari et al. (2024); Usman & Yusuf, (2022) traditional games contribute to the development of numeracy skills, analytical abilities, and concentration levels of children. Although traditional games have a positive impact on cognitive development, they might not, however, always improve every facet of cognitive development, particularly performance abilities like fine motor coordination, and visuospatial processing. While social engagement and strategic thinking are emphasised in these traditional games, complicated visual-spatial reasoning and precise motor control both of which are essential for activities demanding hand-eye coordination and fast reflexes, may not be organised into these games resulting in negligible improvement in the areas of maze and coding. Some of the studies also state that traditional games can improve vocabulary mastery, enhance language development in children (Authar et al., 2021). In fact, traditional games are generally recreational, because they require children's creations while playing (Erlangga, 2022). Children's cognitive development is supported when they set up their own play and use objects based on their interests and curiosities (Kaya, 2021). Psychologist Jerome Bruner's theory revolves around the idea of scaffolding, in which teachers/parents give children systematic support during their learning processes, progressively enabling them to grasp increasingly difficult ideas. Bruner's theory emphasises how language shapes cognitive development and stresses the significance of arranging information into meaningful patterns, or "schemata" (Takaya, 2015). Hence, $H_{\circ}6$- There is no significant difference on cognitive

development among children in control and experimental groups with respect to Traditional games is rejected.

4.3.7 Cognitive Development and its dimensions in experimental and control group before and after intervention of Modern games

For the experimental group 2, assessment of cognitive development among children was done before and after intervention of traditional games. The intervention was planned for three months, with two sessions in a week. The intervention introduced total of nine modern games including- Jigsaw puzzle, Checkers board game, Maze, Crossword game, Seriation board game, Memory game, Matching game, Building blocks game, Ludo game. In each session one modern game was introduced to childreen with 60 minutes per session. All the session were completed with repetition of these 9 modern games and assessment of before and after was taken. The results based on various dimensions like Information, Comprehension, Arithmetic, Similarity, Vocabulary, Digit span, Picture completion, Block, Object assembly, Coding, Maze as well as Cognitive development are discussed under following. The control group was also assessed at the same time without providing any intervention and the comparison between the control group and the experimental group 2 were discussed below.

Table 14: Cognitive Development and its dimensions in experimental and control group before and after intervention of modern games

Dimensions		Before (N=30)			After (N=30)			
	Groups	Mean	SD	t value *p* value	Mean	SD	t value *p* value	Cohens *d*
Information	Experimental	88.46	16.86	-0.14	98.79	14.75	2.27	0.51
	Control	89.00	17.15	0.88	90.48	17.17	0.02*	
Comprehension	Experimental	97.33	14.99	-0.18	107.05	13.26	2.22	0.50
	Control	97.94	15.14	0.85	100.02	14.58	0.02*	
Arithmetic	Experimental	89.48	17.22	-0.06	103.92	15.46	3.55	0.80
	Control	89.76	18.80	0.94	91.48	15.47	0.001*	
Similarity	Experimental	98.25	12.85	0.14	106.82	11.07	2.31	0.52
	Control	98.74	16.91	0.88	99.53	16.24	0.02*	

Dimensions	Groups	Before (N=30) Mean	SD	t value *p* value	After (N=30) Mean	SD	t value *p* value	Cohens *d*
Vocabulary	Experimental	70.43	10.67	-0.18	76.97	10.26	1.96	0.44
	Control	70.87	10.40	0.85	72.30	10.67	0.05*	
Digit span	Experimental	86.43	8.30	0.02	92.53	8.30	2.40	0.54
	Control	86.38	9.62	0.98	87.66	9.55	0.01*	
Picture completion	Experimental	85.56	13.19	0.01	97.92	10.19	3.67	0.83
	Control	85.51	15.80	0.98	86.87	15.76	0.001	
Block	Experimental	96.92	12.09	-0.03	108.64	10.44	3.64	0.82
	Control	97.02	13.64	0.97	98.64	13.58	0.001*	
Object assembly	Experimental	91.53	14.06	-0.02	103.53	12.17	3.32	0.75
	Control	91.61	16.53	0.98	92.66	16.40	0.001*	
Coding	Experimental	106.28	12.76	0.01	116.20	12.47	2.96	0.67
	Control	106.23	12.99	0.98	107.82	12.47	0.004*	
Maze	Experimental	93.89	9.53	0.02	102.25	9.35	3.55	0.80
	Control	93.84	9.32	0.98	94.76	9.24	0.001*	
Overall Cognitive development	Experimental	91.64	6.94	-0.06	99.77	6.27	3.84	0.87
	Control	91.74	6.36	0.95	93.83	7.33	0.001*	

***Significant at 5% level, **Significant at 1% level**

From the results of Table 14, it was found that after the intervention of the modern game with experimental group 2, in Information (Mean=98.79, SD=14.75), Comprehension (Mean=107.05, SD=13.26), Similarity (Mean=106.82, SD=11.07), Vocabulary (Mean=76.97, SD=10.26), and Digit span (Mean=92.53, SD=8.30), Cohen's *d* values were 0.51, 0.50, 0.52, 0.44, and 0.54, respectively, which indicates a medium effect size of the intervention program on these specific areas of development in children. Whereas, regarding Arithmetic (Mean=103.92, SD=15.46), the Cohen's *d* value was 0.80, indicating a large effect size of modern game intervention in that particular area in children. It was also observed that in case of Object Assembly (Mean=103.53, SD=12.17) and Coding (Mean=116.20, SD=12.47), the Cohen's *d* values were 0.75 and 0.67, respectively, indicating a medium effect size of the intervention program. While, regarding Picture Completion (Mean=97.92, SD=10.19), Block (Mean=108.64, SD=10.44), and Maze (Mean=102.25, SD=9.35) as well as Overall Cognitive

development (Mean=99.77, SD=6.27), the Cohen's *d* values were found to be 0.83, 0.82, 0.80, and 0.87, respectively, representing a large effect size of the intervention program on children.

Modern games are intentionally designed play activities that are governed by specific rules and objectives while stimulating the brain to visualize and manipulate objects mentally, which is a crucial component of creative thinking. These games encourage children to express ideas and solutions without relying on linguistic abilities but on the ability to think rationally, recognize patterns, and develop new ways of seeing and interacting with the world. By engaging children in spatial reasoning, problem-solving and open-ended exploration, these games help to cultivate the flexible, innovative thinking that is at the core of creativity. For instance, "Jigsaw puzzles" game improve creativity, spatial reasoning, problem-solving abilities, and attention span. Children's fine motor abilities and hand-eye coordination also improve as they work with puzzle pieces. Logical reasoning and visual perception are strengthened through the act of recognising shapes, identifying patterns, and fitting pieces together. Jigsaw puzzles demand persistence and focus to complete, which promotes prolonged attention and cognitive flexibility. Children who solve puzzles also improve their memory retention by remembering where the pieces are placed. Moreover, children's logical reasoning, sequencing, and problem-solving skills are strengthened by a "Seriation" board game, which improves cognitive development. It facilitates comprehension of patterns, order, and relationship ideas like colour, shape and size. Furthermore, during "Maze" game, children must learn to organise, identify patterns, and make decisions when navigating mazes, which improves executive skills including working memory and cognitive flexibility. Building "Block" game also helps children visualise constructions, balance parts, and understand geometric relationships, which in turn promotes spatial perception, creativity, and logical reasoning. Thus, children might perform high in the areas of picture completion, block, object assembly and maze category of cognitive development. additionally, "Memory" and "Matching" games strengthen working and long-term memory by asking children to remember card locations or match identical patterns. Retention of memories and recall speed are also enhanced by the repeated retrieval process. Furthermore, "Matching" games promote cognitive flexibility by encouraging children to find similarities between things, which helps them recognise patterns and classify information which are necessary for logical reasoning and problem-solving and thus, children might have improvement in similarity, coding and digit span domain after the intervention. Moreover, playing "Ludo" game helps children

develop their number sense and fundamental arithmetic skills by requiring them to count, add, and predict movements based on dice rolls. Regular practice of these calculations improves numerical fluency and mental math skills. Similarly, “Checkers” game requires children to strategically prepare by analysing moves, counting spaces, and anticipating sequences and encourages mathematical and logical thinking. Thus, help children become more proficient in math while also increasing their cognitive flexibility and strategic thinking abilities and hence children might score higher in arithmetic domain after the intervention. Similarly, Children are exposed to new words through “Crossword” game which reinforce word meanings, spelling, and contextual usage. The problem-solving component of this game improves critical thinking and language processing. Similarly, “Memory” games help with vocabulary retention by enhancing word recognition and recall. As children match words or images frequently, they form associations that improve their understanding and cognitive flexibility and thereby children might have improvement in the areas of information, comprehension and vocabulary after the intervention.

The study is supported by Estrada-Plana et al. (2024); Lakshmi & Ponnusamy, (2021) stating that modern games require strategic thinking and problem-solving, which exercises working memory, visual memory and attention as children must hold and manipulate information in their minds. Similarly, modern games encourage children to manipulate play materials fostering creativity and problem-solving through hands-on play that allows children to experiment and learn through trial and error, promoting imagination, encourages independent thinking and enhances collaboration (Kay et al., 2023). Additionally, the persistence and effort required to complete these games strengthen attention span and concentration abilities, which are critical for the development of cognitive abilities (Zahroh et.al, 2024). The psychologist Bruner asserts that children can apply the new behaviour combinations they learn in their play to resolve issues in their real life. The child then retains the new and useful behaviour patterns that they learnt during play. Children thus get the flexibility to explore a variety of behavioural potential during play. Hence, the null hypothesis $H_{\circ}7$- There is no significant difference on cognitive development among children in control and experimental groups with respect to Modern games is rejected.

4.3.8 Cognitive Development and its dimensions in experimental and control group before and after intervention of Blended games

The respondents' cognitive development was assessed both before and after the blended gaming interaction with the experimental group 3. The intervention was scheduled

for three months, with two sessions per week. The intervention included nine traditional Assamese games, including Luka bhaku, Along dolong, Tekeli bhonga, Ganga rani, Sit pokhila, Kut kut, Aire amar togor, Rumal sur, and Borof aru pani, which were taught to children. In addition, the intervention included nine modern games: Jigsaw puzzle, Checkers board game, Maze, Crossword game, Seriation board game, Memory game, Matching game, building Blocks game and Ludo. Each week, two sessions were held, one with a traditional game and the other with a modern game, with each session lasting 60 minutes. All of the sessions were completed using these traditional and modern games, and a comparison of before and after was made. The results were discussed below in terms of several aspects such as information, understanding, arithmetic, similarity, vocabulary, digit span, picture completion, block, object assembly, coding, maze and overall cognitive development. Simultaneously, the control group was also analysed without any intervention; the following describes the differences between the control group and experimental group 3.

Table 15: Cognitive Development and its dimensions in experimental and control group before and after intervention of Blended games

		Before (N=30)			After (N=30)			
Dimensions	**Groups**	**Mean**	**SD**	**t value** *p* **value**	**Mean**	**SD**	**t value** *p* **value**	**Cohens** *d*
Information	Experimental	88.51	18.85	-0.12	104.17	16.66	3.57	0.80
	Control	89.00	17.15	0.90	90.48	17.17	0.001*	
Comprehension	Experimental	97.28	15.31	0.0.19	111.38	13.60	3.55	0.80
	Control	97.94	15.14	0.84	100.02	14.58	0.001*	
Arithmetic	Experimental	89.87	18.00	0.02	104.71	16.17	3.69	0.83
	Control	89.76	18.80	0.98	91.48	15.47	0.001*	
Similarity	Experimental	98.33	15.04	-0.11	110.89	13.33	3.37	0.76
	Control	98.74	16.91	0.91	99.53	16.24	0.001*	
Vocabulary	Experimental	71.00	11.73	0.05	80.38	8.47	3.70	0.83
	Control	70.87	10.40	0.95	72.30	10.67	0.001*	
Digit span	Experimental	86.53	7.82	0.07	94.33	7.96	3.34	0.75
	Control	86.38	9.62	0.93	87.66	9.55	0.001*	
Picture	Experimental	85.58	13.54	0.02	98.43	12.21	3.62	0.82
completion	Control	85.51	15.80	0.98	86.87	15.76	0.001	

Dimensions	Groups	Before (N=30) Mean	SD	t value *p* value	After (N=30) Mean	SD	t value *p* value	Cohens *d*
Block	Experimental	96.76	14.22	-0.08	109.61	12.80	3.67	0.83
	Control	97.02	13.64	0.93	98.64	13.58	0.001*	
Object assembly	Experimental	91.74	14.94	0.03	105.48	13.52	3.76	0.85
	Control	91.61	16.53	0.97	92.66	16.40	0.001*	
Coding	Experimental	106.00	12.52	-0.08	117.76	11.40	3.67	0.83
	Control	106.23	12.99	0.93	107.82	12.47	0.001*	
Maze	Experimental	93.69	10.57	-0.06	102.23	8.10	3.78	0.85
	Control	93.84	9.32	0.94	94.76	9.24	0.001*	
Overall Cognitive development	Experimental	91.25	7.88	-0.30	100.47	6.13	4.34	0.98
	Control	91.74	6.36	0.76	93.83	7.33	0.001*	

Table 15 displays cognitive development and its dimensions in experimental and control group before and after intervention of blended games. From the results, it was observed that all the dimensions of cognitive development children had improved noticeable performance in the experimental group 3. Regarding dimensions of Information (Mean=104.17, SD=16.66), Comprehension (Mean=111.38, SD=13.60), Arithmetic (Mean=104.71, SD=16.17) Vocabulary (Mean=80.38, SD=8.47), Picture completion (Mean=98.43, SD=12.21), Block (Mean=109.61, SD=12.80), Object assembly (Mean=105.48, SD=13.52), Coding (Mean=117.76 , SD=11.40) and Maze (Mean=102.23, SD=8.10), significant difference was observed and Cohen's *d* values were 0.80, 0.80, 0.83, 0.83, 0.82, 0.83, 0.85, 0.83, 0.85 respectively indicating large effect size of blended games intervention on these specific areas of development. Moreover, in case of Similarity (Mean=110.89, SD=13.33) and Digit span (Mean=94.33, SD=7.96), significant difference was found and Cohen's *d* values were 0.76 and 0.75 respectively representing medium effect size of the intervention programme. Additionally, a significant difference in cognitive development (Mean=100.47, SD=6.13) was observed with a Cohen's d value of 0.98 suggesting that the blended intervention game had a large impact on children.

Traditional games are deeply rooted cultural activities that have been handed down through the ages, capturing a society's norms, values, and social systems. These games are

frequently distinguished by strategy, social connection, and physical exertion. Cultural context of these games promotes language development and comprehension as children learn and follow rules, communicate with peers, and engage in collaborative problem-solving through navigating obstacles and devising strategies to succeed. The traditional game “Sit Pokhila”, for example, improves children's listening skills, command obedience, problem-solving ability, and attentiveness. It also helps with item recognition, increases environmental awareness, and promotes constant attention. Similarly, “Tekeli bhonga” encourages sensory learning and spatial awareness, which aids in information processing and learning about the environment. “Aire Amar Togor”, “Ganga Rani”, and “Along dolong” are games that emphasise group engagement, peer connections, and communication through verbal and nonverbal exchanges. These interactions improve vocabulary and comprehension skills. The game “Kutkut” incorporates fundamental numeracy concepts such as number recognition, counting, and sequencing, while also boosting arithmetic skills through entertaining physical activity. It promotes the development of early mathematical thinking and spatial abilities. “Borof aru pani” promotes speedy decision-making, focus, and logical reasoning by requiring children to adapt to changing situations and solve problems using pattern identification and cause-effect analysis. Similarly, “Luka bhaku” improves cognitive abilities like spatial reasoning, strategic thinking, and adaptable problem solving. Collectively, these traditional games offer children meaningful learning experiences that may help them improve their verbal skills and overall cognitive development. The finding is supported by the study of Khoiri et al., (2023) stating that traditional games significantly impact critical and creative thinking and enhance collaboration among children. Additionally, these games can enhance children's self-confidence, communication skills, cooperation, cohesion, discipline, and empathy (Yatmaz et al., 2021; Wahyuningtyas & Noer 2024). Accordingly, these games stimulate cognitive development by engaging children in activities that require them to think critically and strategically, thereby improving their ability to understand and process information (Mulaudzi et al., 2022; Dewi et al., 2020). Moreover, modern games teach children to express ideas and solutions primarily not on their verbal abilities, but on their capacity to think rationally, recognise patterns, and build new ways of engaging with the world (Darmawati & Amin, 2023). For example, “Jigsaw puzzles” game help children develop spatial reasoning, problem-solving abilities, attention span, fine motor skills, and hand-eye coordination. They also improves memory, logical reasoning, and visual perception by promoting pattern identification and persistence. Similarly, “Seriation” board games foster

cognitive growth by improving sequencing, logical thinking, and comprehension of patterns, order, and relationships like colour, shape, and size. “Maze” games improve executive skills such as working memory and cognitive flexibility by teaching players to recognise patterns and make decisions. Building “Block” games improve spatial sense, creativity, and logical reasoning by encouraging building and balancing. These abilities enable excellent performance in picture completion, block design, item assembly, and maze problems. “Memory” and “Matching” games increase working and long-term memory, recall speed, and retention by requiring players to recognise and retrieve patterns repeatedly. “Ludo” improves number recognition and arithmetic skills via counting, adding, and predicting, which increases numerical fluency and mental numeracy. Similarly, “Checkers” game requires children to strategically prepare by analysing moves, counting spaces, and anticipating sequences and encourages mathematical and logical thinking. The findings supported by the study of Artamevia et al., (2023); Amatullah et al., (2022) stating that modern games offer numerous benefits in children including improved problem-solving abilities, critical thinking, and logical reasoning by challenging them to think critically, recognize patterns, and make decisions. Accordingly, traditional games frequently promote physical activity, cultural awareness, and social interaction while modern games use structured play materials improve cognitive abilities like fine motor skills, memory, problem-solving, and spatial thinking. Combining the two forms of games (blended games) guarantees a complete developmental experience that fosters cognitive as well as social development. A balanced approach encourages cultural identity, cohesion, creativity, critical thinking, problem solving and teamwork, providing a strong foundation for holistic development fostering more comprehensive cognitive development in children resulting in higher improvement in the areas of Information, Comprehension, Arithmetic Vocabulary, Picture completion, Block, Object assembly, Coding as well as maze. Thus, the combination of traditional and modern games (Blended games) yields better results in cognitive development by offering a diverse range of challenges that stimulate different cognitive domains. Hence, the null hypothesis $H_{o}8$- There is no significant difference on cognitive development among children in control and experimental groups with respect to Blended games is rejected.

4.4 Benefits of interventions of traditional, modern and blended games on Socio-Cognitive Development of Children

The present study involved the implementation of three different interventions namely- Traditional games, Modern games, and Blended games to three experimental groups.

Each intervention was given for up to three months, with two sessions per week lasting 60 minutes each. The assessment of social and cognitive development of children was done before the intervention, during and after the intervention to find out the effectiveness of the intervention programme on socio-cognitive development of children. The study also assesses which intervention yielded better result on socio-cognitive development. Before the intervention, during the intervention and after the intervention was determined to apply Two Way Repeated measures MANOVA, also known as doubly multivariate MANOVA, to calculate statistically to derive three-time scores for two dependent variables based on independent variables. A Two Way MANOVA of repeated measures [3 (experimental groups) x 3 (before, during and after intervention scores of both dependent variables namely social and cognitive development)] was calculated. The outcomes are shown in the section below:

4.4.1 Mean and Standard Deviation of the Experimental groups in the Before, During and After Phases of Interventions for social and Cognitive development

The assessment of both the social and cognitive development was done before, during and after the intervention programme of Traditional, Modern and Blended games. The mean differences of social development and cognitive development among children before, during and after intervention are discussed below.

Table 16: Mean and Standard Deviation of the Experimental groups in the Before, During and After Phases of Interventions for Social and Cognitive development

Dependent Variables	Independent Variables (Interventions)	Time of measurement	Experimental group	
			Mean	SD
Social Development	Traditional games	Before Intervention	90.76	8.04
		During Intervention	93.76	7.69
		After Intervention	98.89	6.87
	Modern games	Before Intervention	90.61	7.21
		During Intervention	92.89	6.88
		After Intervention	97.43	6.36
	Blended games	Before Intervention	90.30	6.12
		During Intervention	93.97	5.98
		After Intervention	99.69	6.24

Dependent Variables	Independent Variables (Interventions)	Time of measurement	Experimental group	
			Mean	SD
	Traditional games	Before Intervention	91.82	8.59
		During Intervention	92.70	8.58
		After Intervention	98.48	6.67
Cognitive	Modern games	Before Intervention	91.64	6.94
Development		During Intervention	94.22	6.70
		After Intervention	99.77	6.27
	Blended games	Before Intervention	91.25	7.88
		During Intervention	95.57	7.41
		After Intervention	100.47	6.13

Table 16 represents Mean and Standard Deviation of the Experimental groups in the Before, During and After Phases of Interventions for social and Cognitive development.

Social Development

From the results, it was observed that in case of social development of children, before **Traditional games intervention** the mean value was 90.76 and SD was 8.04, during intervention, it was increased where mean=93.76 and SD=7.69 and after intervention mean values subsequently improved and values were 98.89 and SD=6.87 respectively.

In case of **Modern games intervention**, before intervention the observed mean value of social development was 90.61 and SD was 7.21, during intervention the values were increased (mean=92.89, SD=6.88) and after intervention the values were found to be much better i.e., mean=97.43 and SD=6.36.

In case of **Blended games intervention**, children had mean=90.30 and SD=6.12 before the intervention, where during intervention it was found to be mean=93.97 and SD=5.98 and the values increased to mean=99.69 and SD=6.24.

Cognitive Development

With respect to cognitive development of children, before **Traditional games intervention** the mean value was 91.82 and SD was 8.59, during intervention, it was increased where mean=92.70 and SD=8.58 and after intervention the result found to be mean=98.48 and SD=6.67.

Regarding **Modern games intervention**, before intervention mean value was 91.64 and SD was 6.94, during intervention the values were increased (mean=94.22, SD=6.70) and after intervention the values were found to be mean=99.77 and SD=6.27.

In case of **Blended games intervention**, children had mean=91.25 and SD=7.88 before the intervention, where during intervention it was found to be mean=95.57, SD=7.41 and the values increased to mean=100.47 and SD=6.13.

4.4.2 Test of Sphericity for Social and Cognitive development

Mauchly's Sphericity Test was used to examine the assumption of equal variances across groups in both social and cognitive development. The test results are displayed below.

Table 17: Test of Sphericity for Social and Cognitive development

Variables	Within Subjects Effect	Mauchly's W	Chi-Square	df	*p*
Social development	Intervention	.941	2.26	2	0.32
	Time	.300	44.58	2	<.001
	Intervention * Time	.050	109.21	9	<.001
Cognitive development	Intervention	.922	2.98	2	0.22
	Time	.293	45.46	2	<.001
	Intervention * Time	.034	123.17	9	<.001

As the above Table 17, indicates, for the interaction effect, the test of sphericity is significant, $\chi 2= 109.21$, $p<.001$ for social development and $\chi 2= 123.17$, $p<.001$ for cognitive development. The rule of thumb indicates that reject the null hypothesis if $p < 0.05$. Hence the sphericity (homogeneity) seems to be violated and the test is too liberal or effective. The main within subjects' interaction effects were then computed.

4.4.3. Multivariate Analysis of Variance for Social and Cognitive development

Multivariate analysis of variance (MANOVA) was conducted to assess the effects of independent variables (interventions) on the dependent variables (social and cognitive) and the results are depicted below.

Table 18: Multivariate Analysis of Variance for Social and Cognitive development

Measure	Wilks' Lambda Value	F(df)	p	η2
Intervention (3 groups)	0.89	2.07 (4,152)	0.08	0.05
Time (3-time measures)	0.008	370.88 (4,150)	<.001	0.90
Intervention * Time	0.02	182.12 (8,302)	<.001	0.82

The Table 18, reveals the interaction between the 3 groups of the independent variables (interventions), shown by the F (4, 152) is 2.07, which is not significant. In contrast, a significant difference between the 3-time measures, that is, Before, During and After measures of the dependent variables namely, Social and Cognitive development; where F (4,150) is 370.88, is significant at 0.001 level, and the partial eta square value η2 is 0.90, showing a large effect size.

The multivariate analysis also reveals significant interaction effects between the independent and dependent variables, F (8,302) is 182.12 which is significant at 0.01 level, and the partial eta square value η2 is 0.82, showing a large effect size.

4.4.4 Univariate Analysis of Variance for Social and Cognitive Development in the Experimental Groups

Univariate analysis was conducted for both the variables of social and cognitive development while considering time and interventions, and results are presented below.

Table 19: Univariate Analysis of Variance for Social and Cognitive Development in the Experimental Groups

Source	Measure	Sum of Squares	Mean square	F (df)	p	η2
Intervention	Social development	535.63	267.81	2.10 (2,76)	0.12	0.05
	Cognitive development	517.63	258.81	1.59 (2,76)	.20	0.04
Time	Social development	2951.28	2508.99	1206.75 (1.17, 44.69)	<.001	0.96
	Cognitive development	2903.35	2478.48	2486.32 (1.17, 44.51)	<.001	0.98
Intervention *time	Social development	662.16	165.54	155.69 (2.04, 77.51)	<.001	0.80
	Cognitive development	567.27	355.11	218.05 (1.59 ,77.51)	<.001	0.85

The table 19 reveals that while considering interventions, the interaction effect F (2,76) = 2.10 for social development and F (2,76) = 1.59 for cognitive development were both not significant. Conversely, while considering time, there was a significant interaction effect of F (1.17, 44.69) =1206.75 for social development and F (1.17, 44.51) = 2486.32 for cognitive development were both statistically significant and the η2 (partial eta square) is 0.96 and 0.98 respectively, showing strong effect size.

The univariate analysis also reveals significant interaction effects between the independent and dependent variables, F (2.04, 77.51) = 155.69 for social development which is significant at 0.01 level and the partial eta square value η2 is 0.80, showing a large effect size. In case of cognitive development, F (1.59 ,77.51) = 218.05 which is significant at 0.01 level and the partial eta square value η2 is 0.85, showing a large effect size. The post-hoc values for paired comparisons were then computed.

4.4.5 Pairwise Comparisons for Before, During and After Intervention Phases for the Experimental Groups on Social and Cognitive development

Pairwise comparisons were measured in the before, during and after phases of all the interventions to find out which groups are significantly different from each other and the results are displayed below.

Table 20: Pairwise Comparisons for Before, During and After Intervention Phases for the Experimental Groups on Social and Cognitive development

(I)Time	(J) Time	Mean difference (I-J)		Standard Error	
		Social	Cognitive	Social	Cognitive
Before Intervention	During intervention	-2.98*	-2.59*	0.15	0.14
	After intervention	-8.11*	-8.00*	0.35	0.54
During Intervention	Before Intervention	2.98*	2.59*	0.15	0.14
	After Intervention	-5.12*	-5.41*	0.24	0.44
After Intervention	Before Intervention	8.11*	8.00*	0.35	0.54
	During Intervention	5.12*	5.41*	0.24	0.44

*Significant at .05 level

Post-hoc paired comparisons were performed to understand the effect of Traditional, Modern and Mixed games interventions in before, during and after intervention phases on social and cognitive development. The above Table 20 shows that there was a significant mean difference in before and during intervention phases (M= -2.98, SE=0.15), before and after intervention phases (M= -8.11, SE=0.35) with social development. Similarly, significant mean difference exists even in during and before intervention phases (M= 2.98, SE=0.15), during and after intervention phases (M= -5.12, SE = 0.24). It was also proved that there was a significant mean difference in after and before phases (M = 8.11, SE =0.35), after and during intervention phases (M = 5.12, SE = 0.24) in social development.

Similar results were observed in cognitive development with interventions. The results showed significant mean difference in before and during intervention phases (M = -2.59, SE = 0.14), before and after intervention phases (M= -8.00, SE= 0.54) in cognitive development. Similarly, a significant mean difference observed in during and before intervention phases (M = 2.59, SE = 0.14), during and after intervention phases (M= -5.41, SE =0.44) in cognitive development. The above table also shows that there is a significant mean difference in after and before phases (M= 8.00, SE =0.54), after and during intervention phases (M = 5.41, SE =0.44) in cognitive development.

4.4.6 Profile Plots of Experimental Groups in Social Development under Various Intervention Scores.

To compare the effects of interventions using Traditional, Modern, and Blended games on experimental groups in terms of social development, a profile plot was created, and the results are illustrated in the following figure.

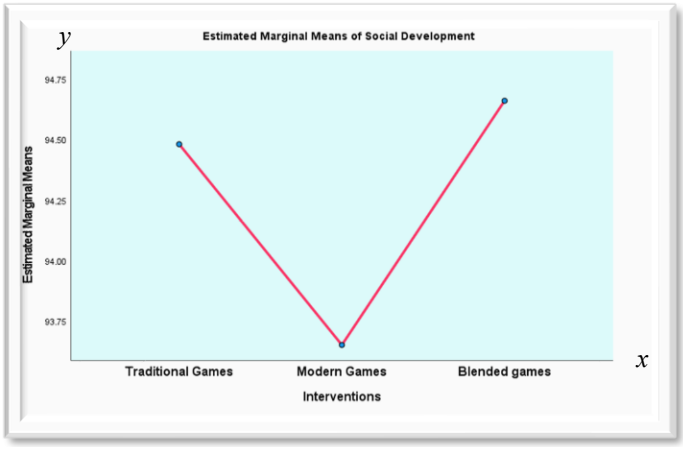

Figure 6: Profile Plots of Experimental groups in Social Development under various Intervention scores.

From the above figure 6, it was revealed that Traditional games and blended games were effective in improving social development of children compared to modern games. It was also found that comparatively Blended games intervention was more effective in social development of children than Traditional games.

The reason behind is because traditional games shows significant positive impact on children' social development which can greatly improve empathy, discipline, social cohesiveness, cooperation, self-confidence, and communication abilities. Additionally, children can learn about cultural values and societal standards through traditional games. Furthermore, these games promote creativity, imagination, effective group interaction, and problem-solving skills. For instance, the traditional game "Tekeli Bhonga" fosters cooperation, verbal coordination, and strategic planning, all of which aid in the development of children's social and communication skills. It enhances cooperation, taking turns, active listening, and peer participation. Additionally, by employing folk tunes that preserve traditional values and promote active collaboration and teamwork, the "Ganga Rani" traditional Assamese game improves peer relationships and communication skills. Whereas, modern games are different from traditional games in that they aim to accomplish specific objectives, allowing children to explore their environment by using their senses and mind. For example, “Jigsaw puzzle” game improve children's attention span, creativity, spatial thinking, and problem-solving skills. Additionally, they enhance visual perception, logical reasoning, hand-eye coordination, and fine motor skills. In fact, modern games do support vocabulary or social interaction, but their fundamental strength lies in encouraging creative thinking and problem-solving abilities (Darmawati & Amin, 2023). Additionally, modern games when playing in groups, teach essential skills such as decision-making, task completion, and rule adherence. Furthermore, these games create engaging environments that foster collaboration and learning, simulate real-world dilemmas, allowing players to practice decision-making in a safe environment. Therefore, traditional games when integrated with modern games (blended games), which basically develop critical thinking, problem-solving, and adaptability, this combination provides a comprehensive framework for effective social interaction, resulting in better social development in children. The finding is supported by the study of Munir et al. (2024); Yatmaz et al., (2021); Wahyuningtyas & Noer (2024) stating that traditional games improve motor skills, body coordination, and social skills like cooperation and communication, discipline, and empathy among children. Whereas, modern games improve children's overall development by supporting psychomotor, language, social-

emotional, and self-care skills. These games combine learning elements with creative activities, fostering creativity and problem-solving abilities in children and helps in improve social interaction skills (Dwiredy & Qalbi, 2021; Kovalevska & Pasichnichenko, 2022). Hence, the null hypothesis H_o9- There is no significant difference between the interventions of Traditional, Modern and Blended games on social development of children is rejected.

4.4.7 Profile Plots of Social Development under before, during and after Intervention scores

To understand social development of children under Traditional, Modern and Blended game interventions in various time durations, such as before, during and after phases of intervention, a profile plot was created, and results are depicted under the following figure.

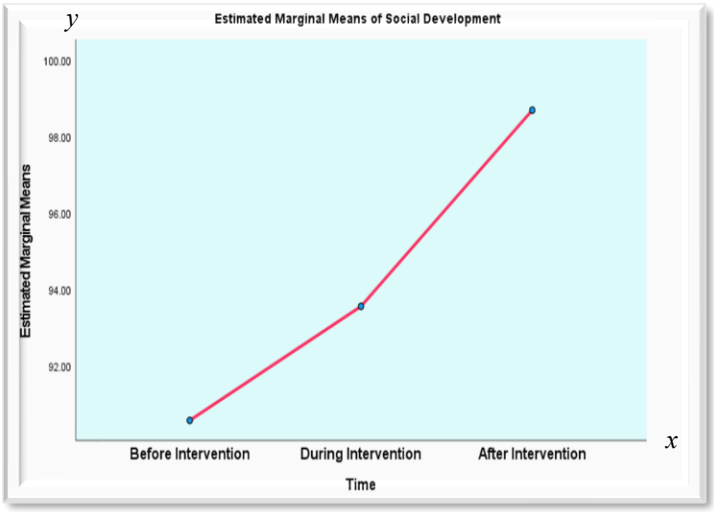

Figure 7: Profile Plots of Social Development under before, during and after Intervention scores

From the above figure 7, it was found that considering before, during and after intervention phases all the three interventions such as Traditional games, Modern games and Blended games were effective during and after intervention phases in improving social development of children. It was also revealed that after intervention phase was having more effectiveness in social development of children than during intervention phase.

Development takes time-

A stimulating and conducive learning environment is crucial for a child's social development as it provides ample opportunities for interaction, collaboration, and positive social experiences, enabling them to learn essential skills like communication, empathy,

cooperation, and conflict resolution, ultimately building strong relationships and fostering a sense of belonging within a group (Pervez & Galea, 2024). By providing a safe and encouraging, environment, children learn to navigate social norms, build friendships, and develop conflict-resolution skills (Haron & Nosri, 2023). For example, "Aire Amar Togor", "Ganga Rani", and "Along dolong" are the games that emphasise group engagement, peer connections, and communication through verbal and nonverbal exchanges. Thus, intervention programmes provide children with consistent opportunities to develop social skills such as cooperation, communication, and conflict resolution by engaging in these interactive games and by reducing environmental barriers thereby promoting the child's social development through stimulation and support (Adams & Gaile, 2024).

4.4.8 Profile Plots of Experimental Groups in Cognitive Development under Various Intervention Scores.

To compare the effects of interventions using Traditional, Modern, and Blended games on experimental groups in terms of cognitive development, a profile plot was created, and the results are illustrated in the following figure.

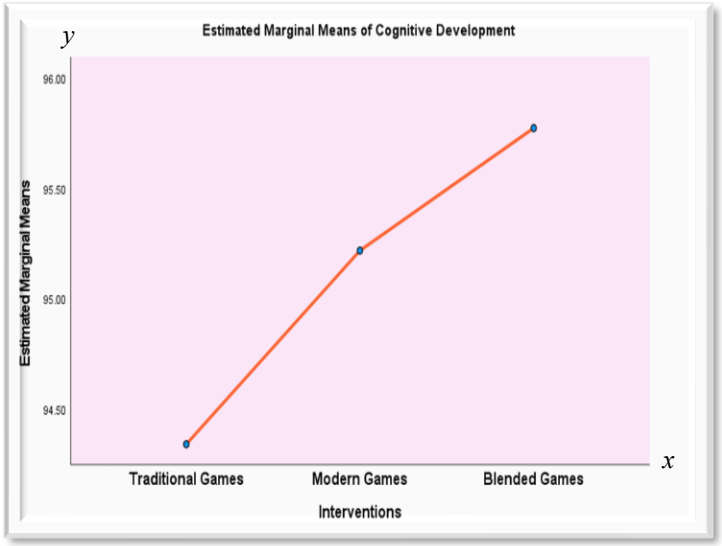

Figure 8: Profile Plots of experimental groups in Cognitive Development under various Intervention scores

From the above figure 8, it was revealed that Modern games and Blended games were effective in improving cognitive development of children. It was also found that traditional games have lower effect in improving cognitive development of children. than those of Modern and Blended games.

The reason is modern games are intentionally designed play activities that are governed by specific rules and objectives while stimulating the brain to visualize and manipulate objects mentally, which is a crucial component of creative thinking. These games can boost critical thinking, hand-eye coordination, problem solving, logical reasoning, creativity, spatial awareness among children. In fact, modern games improve short-term memory, problem-solving abilities, and overall brain development in children. For example, Jigsaw puzzles" game help children develop spatial reasoning, problem-solving abilities, attention span, fine motor skills, and hand-eye coordination. "Seriation" games improve cognitive abilities by fostering the development of pattern identification, logic, and sequencing. "Maze" games improve decision-making and working memory and building "Block" games encourage logical thinking, imagination, and spatial awareness. Memory and matching games improve pattern identification, recall, and retention. The finding is supported by the study of Kay et al., (2023) stating that modern games encourage children to manipulate play materials fostering creativity and problem-solving through hands-on play that allows children to experiment and learn through trial and error, promoting imagination, encourages independent thinking. Additionally, playing these games significantly improves working memory skills and visuospatial memory, strengthens attention span and concentration abilities, which are critical for the development of cognitive abilities (Estrada-Plana et al., 2024, Lakshmi & Ponnusamy 2021). Traditional games, on the other hand, promote strategic thinking, decision making, and problem-solving skills while emphasising cooperation and communication, essential for teamwork as children work together to achieve common goals. They also encourage following rules, social skills such as self-regulation, and interaction with peers. For example, "Along dolong" game emphasise group engagement, peer connections, and communication through verbal and nonverbal exchanges. The study is supported by the study of Gultom et al., (2022); Iswinarti & Suminar, (2019) stating that the cultural context of traditional games promotes language development and comprehension as children learn and follow rules, communicate with peers, and engage in collaborative problem-solving through navigating obstacles and devising strategies to succeed. Since, modern and traditional games focus on various areas of development, playing a combination of each type of game (blended games) is better for children' cognitive development than playing only one of them. While modern games can specifically improve cognitive and problem-solving skills, traditional games frequently encourage social interaction, cohesion, strategic thinking and creativity. Hence, together, they offer a more complete and well-

rounded cognitive developmental experience among children. Hence, the null hypothesis H_o10- There is no significant difference between the interventions of Traditional, Modern and Blended games on cognitive development of children.

4.4.9 Profile Plots of Cognitive Development under before, during and after Intervention scores

To understand cognitive development of children under Traditional, Modern and Blended game interventions in various time durations, such as before, during and after phases of intervention, a profile plot was created, and results are depicted under the following figure.

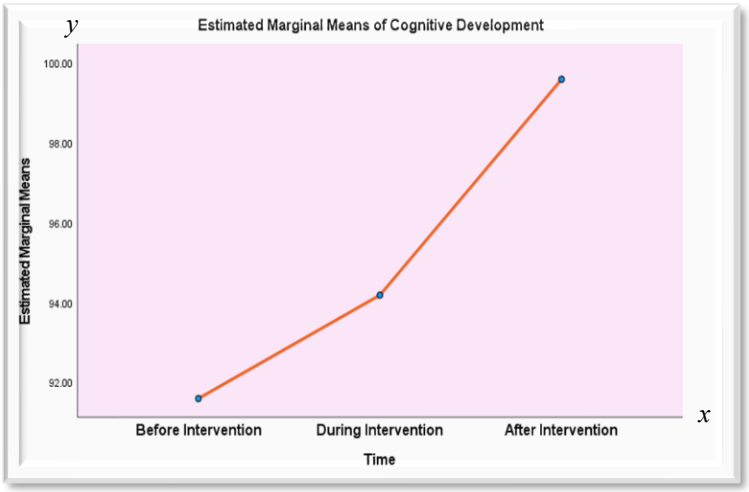

Figure 9: Profile Plots of Cognitive Development under before, during and after intervention scores

From the above figure 9, it was found that interventions were more effective during and after phases. However, no effect was found in before intervention among children.

Development takes time-

Children's cognitive development is greatly influenced by their surroundings, which offer engaging learning experiences through time that shape brain connections and cognitive abilities. A supportive and enriched environment fosters curiosity, exploration, and critical thinking, laying the foundation for lifelong cognitive growth. Intervention programmes based on traditional, modern and blended games offer structured learning experiences through

playing games that accelerate cognitive growth among children. For example, playing "Memory" and "Matching" games repeatedly improves working memory, attention, and concentration, all of which contribute to cognitive development. The finding is supported by the study of Crotty et al., (2023); Brown et al., (2022) stating that providing sustained engagement, repeated practice, and cumulative learning opportunities positively impact cognitive development in children. Over time, children can internalize new skills and concepts, leading to deeper understanding and long-lasting cognitive gains. Additionally, interventions allow for the gradual building of complexity in tasks, reinforcing neural pathways and promoting greater adaptability in cognitive functions. This extended exposure also enables learning improvements in children and increasing use of efficient problem-solving strategies, leading to more profound and enduring cognitive improvements (Pietto et al., 2023; Supekar et al., 2021).