

Interpersonal Engagement across Levels of Digital Engagement among Higher Secondary Students

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ABSTRACT

This study examines the influence of digital engagement on interpersonal engagement among higher secondary students. Data were collected from 470 students in Kozhikode district through a survey method. Data were collected by using the tools Questionnaire on Digital Engagement and Interpersonal Engagement Scale (Arya & Muneer, 2024). The data were analyzed using percentage analysis and one-way ANOVA. The study found that all the students studied used digital devices and most of them (66.4%) were for academic purposes. The ANOVA results show that excessive use of social media and digital games (more than 3 hours) significantly reduced students' interpersonal engagement ($p < .01$). The use of technology for academic purposes does not adversely affect social relationships. This study highlights the need to maintain a balance between technology and direct social interactions.

Key terms: Digital Engagement, Interpersonal Engagement, Higher Secondary Students.

INTRODUCTION

Technology has brought about major changes in the field of education. Learning is possible anywhere, anytime through online platforms and virtual classrooms. Incorporating technology in classrooms facilitates collaborative learning and personalized instruction (Brown & Green, 2022). However, it also presents challenges such as the digital divide and maintaining student motivation (Miller, 2021). Technology has also profoundly impacted social interactions. Social media and virtual communication tools help maintain relationships across geographical boundaries (Subrahmanyam & Greenfield, 2008). Video conferencing and online communities have become a part of personal and professional life (Kietzmann et al., 2011). However, this has led to a decrease in face-to-face conversations and problems such as social isolation (Valkenburg & Peter, 2011).

Interpersonal engagement is not just a social interaction, it is the quality of meaningful relationships formed through empathy and attentive listening (Kahu, 2013). It has emotional and intellectual dimensions (Fredricks et al., 2004). It is essential to create a positive environment through constructive communication and mutual support (Skinner & Pitzer, 2012). In the field of education, such interactions increase the quality of learning and mental strength of students (Kahu, 2013). Similarly, it helps in developing leadership skills and resolving conflicts in the workplace (Baker, 2010).

Need and Significance of the study

As digital technologies become an integral part of all aspects of students' lives, concerns about excessive digital engagement have emerged (Hinkley & Taylor, 2012). Students who spend more time on digital platforms, whether for social media, gaming, or even online learning, may face a number of challenges. Overreliance on technology is a major problem. This affects students' concentration, reduces their attention span and limits their interest in traditional learning methods (Best et al., 2014). The feeling of always having to be active on social media or other online spaces can increase anxiety and stress in students (Kiryaly et al., 2019). These types of excessive digital engagement can also may impact interpersonal relationships. While digital communication is

convenient, it often lacks the emotional connection and depth that comes with face-to-face conversations. When students prioritize digital communication over face-to-face interactions, empathy, active listening, Social skills such as emotional intelligence are likely to weaken. This shift from face-to-face interactions to digital communication may lead to difficulties in establishing meaningful relationships in personal and academic situations. This suggests a possible decrease in interpersonal engagement.

In today's digital age, it is essential to understand how digital interactions affect student growth (Kearns & Whitelaw, 2021). Given the important role digital devices play in education, entertainment and socialization, their pros and cons need to be examined (Best et al., 2014). How digital use affects learning quality, concentration and cooperativeness is important (Zhao et al., 2019). It would be appropriate to study how screen fatigue and digital addiction caused by excessive use shape students' personal and social development (Kiraly et al., 2019). As online learning methods become widespread, the decrease in face-to-face interactions may affect the quality of intrinsic communication. Face-to-face interactions are essential for developing the social-emotional skills necessary for academic and personal growth (Goleman, 1995). Such contexts help students develop empathy, trust and problem-solving skills (Baker, 2010). Life skills such as teamwork and emotional intelligence are difficult to acquire in the digital world alone. While digital devices can help us connect globally, their overreliance on them can limit opportunities for direct communication (Turkle, 2015). Finding a balance between technology and personal relationships can help students become socially responsible and technologically literate (Best et al., 2014; Goleman, 1995). This will enable them to meet the challenges of the professional world of the future. Present study sheds light on the relationship between digital engagement and interpersonal engagement. Striking a balance between technology and direct social interactions is essential in today's era. The findings of this research will be beneficial to all stakeholders including students, parents, teachers and policymakers. This study provides a clear direction for the holistic development of students and for shaping a generation with better social awareness along with technological skills.

Variables of the Study

The present study aims to find the influence of digital engagement on interpersonal engagement among higher secondary school students. The variables in the study are:

Independent variable: Digital engagement

Dependent variable: Interpersonal engagement

Objectives of the Study

1. To find out level and patterns of digital engagement among higher secondary school students.
2. To find out the influence of Duration of Social Media Usage on Interpersonal Engagement among higher secondary school students.
3. To find out the influence of Duration of Digital Game Usage on Interpersonal Engagement among higher secondary school students.
4. To find out the influence of use of Digital Device for Learning on Interpersonal Engagement among higher secondary school students.

Methodology of the Study

Method

Descriptive survey method

Tools Used

The following tools used for data collection.

Questionnaire on Digital Engagement (Arya & Muneer,2024)

The Digital Engagement Questionnaire was developed by the researcher to assess the pattern and purpose of digital device usage among higher secondary school students. The tool aims to explore not only the types and duration of digital device use but also the specific purposes such as social media interaction, digital gaming, and learning-related activities. To ensure the content validity and clarity of the items, the draft questionnaire was reviewed by academic experts in educational research and digital literacy. Their feedback focused on the appropriateness of language, item structure, and the relevance of content to the target group

Scale on Interpersonal Engagement (Arya & Muneer,2024)

The scale is designed to assess the level of Interpersonal Engagement among individuals in various life situations. It aims to measure attitudes, reactions, and behaviours reflecting one's capacity for acceptance, patience, and understanding in a culturally and socially diverse society. The review of related literature helped the investigator to focus on the various dimensions of Interpersonal Engagement. The dimensions such as Verbal communication, Active Listening, Emotional Regulation, Adaptability and Trust and Honesty were selected for the development of the scale. As present scale is a Likert type scale, responses can be made in a 5-point scale as Always, Often, Sometimes, Rarely, Never, For positive statement the score is given a 5,4,3,2 & 1 for the options Always, Often, Sometimes, Rarely, Never, respectively. Scoring procedure scheme is reversed for negative statement.

Items with critical ratio greater than 1.96 was selected for the final tool. Out of the 38 items in the draft tool, 33 items were selected for the final tool based on the criterion of having a t value greater than 1.96. Reliability of the Interpersonal Engagement Scale was established by using Cronbach's alpha and test re-test method. Internal consistency of the tool established by using Cronbach's alpha. The reliability coefficient obtained in Cronbach's alpha was 0.84. Reliability coefficient obtained in test-retest is 0.76. The tool was ensured to have both construct validity and face validity.

Sample Selected for the Study

The study was conducted on a sample of 470 higher secondary students from Kozhikode district.

Statistical Techniques Used

The data collected were analysed using the following technique

- Percentage analysis
- One way ANOVA

Level and Patterns of Digital Engagement

This section examines the various levels of digital device use by higher secondary students. This includes the devices students use, their purposes, how much time they spend on them and how they leverage technology for learning and entertainment.

Type of Digital Devices Used by Higher Secondary School Students

This section discusses the digital devices commonly used by higher secondary students in their daily lives. It helps to understand which devices are most popular and easily accessible among students. Results are presented in table

Table 1 Type of Digital Devices Used by Higher Secondary School Students

Si.No	Item	N	Percentage
1	Number of students using digital devices	470	100
Type of Digital Devices Used			
1	Mobile phone	460	97.9
2	Laptop	23	4.9
3	Computer	9	1.9

From the table it is clear that, all 470 students (100%) surveyed use digital devices. This shows the extent of the influence of technology among students. 97.9 percent (460) of the students surveyed use mobile phones. This indicates that mobile phones are the most popular and easily accessible device among students. The number of laptop users is very less compared to mobile phones. Only 4.9 percent (23) of the students use laptops. The least usage is for computers. Only 1.9% (9) of the students use desktop computers.

Purpose of Digital Device Use Among Higher Secondary School Students

In this section analyse the purpose of digital device use - whether for learning, entertainment, or social networking.

Table 2 Purpose of Digital Device Use Among Higher Secondary School Students

Si.No	Item	N	Percentage
1	Learning	312	66.4
2	Entertainment	108	23.0
3	Social networking	137	29.1

Table indicate that the use of digital devices among students is for various purposes. The majority of the students surveyed, i.e. 66.4 percent (312), use digital devices for learning purposes. This shows that technology is being utilized to a great extent for knowledge acquisition and online learning.

The second most important use among students is interaction on social media platforms. 29.1percent (137) of students use digital devices to stay connected with friends and others. The number of students who use digital devices for entertainment purposes (gaming, movies, etc.) is 23.0 percent (108).

Social Media Usage Among Higher Secondary School Students

This section discusses how higher secondary school students use social media platforms. It not only shows that all students in the study are active on social media, but also explores the different purposes for which they use these platforms.

Table 3 Social Media Usage Among Higher Secondary School Students

Si. No.	Item	N	Percentage
1	Number of students using social media	470	100
Purpose of Social Media Use			
1	Entertainment	171	36.4
2	Communication	79	16.8
3	Shopping	49	10.4
4	Education	192	40.9
5	For making Reels and Shorts	94	20

This table shows that all 470 students (100%) who participated in the survey are using social media. The largest number of respondents, i.e. 40.9 percent (192) use social media for educational purposes. This indicates that social media has become an important medium for gathering information and sharing educational knowledge. The second most important purpose is entertainment. 36.4 percent (171) students use social media for jokes, movies, etc. An important finding is that 20 percent (94) students are not just viewers but also creative participants in making videos (Content Creators). 16.8 percent (79 people) use social media for communication and 10.4 percent (49 people) use social media for online shopping.

Duration of Digital Media Device Use Among Higher Secondary School Students

This section examines how much time higher secondary school students spend using digital devices on a daily basis.

Table 4 Duration of Digital Media Device Use Among Higher Secondary School Students

Si.No	Item	N	Percentage
1	Less than 1 hour	168	35.7
2	1 to 3 hours	215	45.7
3	More than 3 hours	87	18.5

By analyzing the data on the time students spend in the digital world, it shows that, the largest number of students surveyed, i.e. 45.7 percent (215), use digital devices for 1 to 3 hours a day. This indicates a moderate level of digital engagement. 35.7 percent (168) of students spend less than an hour on digital platforms. This shows that there is a segment of students who use technology with proper control for studies and other things. 18.5 percent (87) of students allocate more than 3 hours a day to digital devices.

Digital Game Usage Among Higher Secondary School Students

This section explores how higher secondary school students engage with digital games. It includes the proportion of students who do not play digital games, those who play occasionally and those who spend significant time gaming.

Table 5 Digital Game Usage Among Higher Secondary School Students

Si. No	Item	N	Percentage
1	Non users	262	55.7
2	Less than 1 hour	126	26.8
3	1 to 3 hours	57	12.1
4	More than 3 hours	25	5.3

Results of the table shows that more than half of the students surveyed, i.e. 55.7 percent (262), do not use digital games. A large proportion of those who play games, i.e. 26.8 percent (126), spend less than an hour a day on it.

This indicates a moderate gaming habit. 12.1 percent (57) of students engage in gaming for 1 to 3 hours a day. Only a very small percentage of students, i.e. 5.3 percent (25) play games for more than three hours.

Use of Digital Devices for Educational Purposes among Higher Secondary School Students

This section focuses on how students use digital devices specifically for educational purposes. It includes number of students who use digital devices for learning and the specific activities they engage in, such as preparing assignments, taking notes and watching online classes.

Table 6 Use of Digital Devices for Educational Purposes Among Higher Secondary School Students

Si. No	Item	N	Percentage
1	Number of students using Digital Device for Educational Purpose	312	66.4
Educational purpose			
1	Assignment Preparation	205	43.6
2	Note Preparation	190	40.4
3	Watching Classes	123	26.2

This table shows the extent to which technology has an impact on the learning process. 66.4 percent (312) of the students surveyed use digital devices for learning purposes. The highest number of students, 43.6 percent (205) rely on digital devices to prepare their assignments. 40.4 percent (190) students use digital technology to prepare study notes. 26.2 percent (123) students are interested in studying subjects through video classes and online platforms.

Duration of Digital Device Use for Educational Purposes Among Higher Secondary School Students

This section focuses on how long students use digital devices for educational purposes on a daily basis. It provides an understanding of how much time is devoted to learning activities.

Table 7 Duration of Digital Device Use for Educational Purposes Among Higher Secondary School Students

Si. No.	Item	N	Percentage
1	Less than 1 hour	221	47.0
2	1 to 3 hours	216	46.0
3	More than 3 hours	33	7.0

Influence of Digital Engagement on Interpersonal Engagement of Higher Secondary School Students

One of the major objectives of present study is to find the Influence of Digital Engagement on Interpersonal Engagement of higher secondary school students. To study the influence, the duration of digital device usage was examined across three aspects: social media usage, digital game usage and usage for learning purposes. The analysis of influence is presented under three headings. To find the influence of duration of social media usage, digital game usage and usage for learning purposes on Interpersonal Engagement, one-way ANOVA was used.

Influence of Duration of Social Media Usage on Interpersonal Engagement

Mean scores of Minimal User (less than one hour), Average User (1 to 3 hours) and Frequent User (more than 3 hours) compared using one-way ANOVA and results are presented in table

Table 8 Results of ANOVA of Interpersonal Engagement based on Duration of Social Media Usage

Source of Variance	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3022.807	2	1511.403	9.67	.001
Within Groups	72966.055	467	156.244		
Total	75988.862	469			

Table shows that there exists a significant difference in the mean scores of Interpersonal Engagement between the three groups based on duration of social media usage (minimal user, average user and frequent user) of higher secondary school teachers ($F(2,467) = 9.67, p < .01$).

To check the significance of difference of scores between the Groups, Post Hoc tests were carried out. Results of the Post Hoc tests are presented in table

Table 9 Summary of Post Hoc test for Interpersonal Engagement by Duration of Social Media Usage

Social Media Usage		Mean Difference	Std. Error	Sig.
Minimal User (Mean = 122.46)	Average User (Mean = 120.55)	1.89	1.29	.340
Minimal User	Frequent User (Mean = 115.23)	7.22*	1.65	.001
Average User	Frequent User	5.32*	1.59	.004

Table shows that there is a significant difference in the Interpersonal Engagement of minimal user and frequent user of social media (MD= 7.22, $p < 0.01$). There is a significant difference in the Interpersonal Engagement of frequent user & average user (MD= 5.32, $p < 0.01$). There is no significant difference in Interpersonal Engagement of minimal user & average user (MD= 1.89, $p > 0.05$). Result indicates a clear declining trend in Interpersonal Engagement as the duration of social media usage increases. Minimal users of social media (less than one hour) exhibit the highest levels of interpersonal engagement, followed by average users (1 to 3 hours), while frequent users (more than 3 hours) show the lowest levels. This suggests that excessive use of social media may negatively impact students' ability to engage interpersonally.

Influence of Duration of Digital Game Usage on Interpersonal Engagement

Mean scores of Non-User, Minimal User (less than one hour), Average User (1 to 3 hours) and Frequent User (more than 3 hours) compared using one-way ANOVA and results are presented in table

Table 10 Results of ANOVA of Interpersonal Engagement based on Duration of Digital Game Usage

Source of Variance	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	4552.455	3	1517.485	9.90	.001
Within Groups	71436.407	466	153.297		
Total	75988.862	469			

Table shows that there exists a significant difference in the mean scores of Interpersonal Engagement between the four groups based on duration of digital game usage (non-user, minimal user, average user and frequent user) of higher secondary school teachers ($F(3,466) = 9.90, p < .01$).

To check the significance of difference of scores between the Groups, Post Hoc tests were carried out. Results of the Post Hoc tests are presented in table

Table 11 Summary of Post Hoc test for Interpersonal Engagement by Duration of Digital Game Usage

Digital Game Usage		Mean Difference	Std. Error	Sig.
Non-User (M =122.49)	Minimal User (M=119.01)	3.48	1.34	.082
Non-User	Average User (M=116.96)	5.53*	1.80	.026
Non-User	Frequent User (M= 110.40)	12.09*	2.59	.000
Minimal User	Average User	2.04	1.97	.785
Minimal User	Frequent User	8.61*	2.71	.019
Average User	Frequent User	6.56	2.97	.182

Table shows that there is a significant difference in the Interpersonal Engagement of non-user and average user of digital game (MD= 5.53, $p < 0.05$), non-user and frequent user of digital game (MD= 12.09, $p < 0.01$) and minimal user and frequent user of digital game (MD= 8.61, $p < 0.05$). There is no significant difference in Interpersonal Engagement of non-user & minimal user, minimal user & average user and average user & frequent user. Results reveal a clear negative trend in interpersonal engagement with increasing duration of digital game usage. Non-users of digital games (M = 122.49) recorded the highest mean score in interpersonal engagement, followed by minimal users (M = 119.01), average users (M = 116.96) and frequent users (M = 110.40). As higher scores indicate greater interpersonal engagement, these findings suggest that increased duration of digital game

usage is associated with a decline in interpersonal engagement among higher secondary school students. This implies a potential adverse impact of excessive digital gaming on students' interpersonal competencies.

Influence of Duration of use of Digital Device for Learning on Interpersonal Engagement

To find the influence of duration of use of digital device for learning on Interpersonal Engagement, one-way ANOVA was used. Mean scores of Minimal User (less than one hour), Average User (1 to 3 hours) and Frequent User (more than 3 hours) compared using one-way ANOVA and results are presented in table

Table 12 Results of ANOVA of Interpersonal Engagement based on Duration of use of Digital Device for Learning

Source of Variance	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	860.712	2	430.356	2.67	.070
Within Groups	75128.149	467	160.874		
Total	75988.862	469			

Table shows that there is no significant difference in the mean scores of Interpersonal Engagement between the three groups based on duration of use of digital device for learning (minimal user, average user and frequent user) of higher secondary school teachers ($F(2,467) = 2.67, p > .05$). This suggests that the amount of time spent using digital devices for educational activities does not appear to influence the interpersonal engagement of higher secondary school students

CONCLUSION

The findings of this study suggest that there is a significant relationship between digital engagement and interpersonal engagement. The study showed that excessive use of social media and digital games negatively affects students' direct communication skills and social relationships. Aanalysis shows that the level of interpersonal engagement is lower in those who use social media for more than three hours (Frequent Users) and those who play digital games excessively. This finding is consistent with a study by Turkle (2015); he observes that frequent connections through technology often reduce the quality of conversations and empathy (Empathy). A study by Kiraly et al. (2019) also points out that excessive digital use can lead to social isolation.

Finding also shows that digital use for educational purposes does not affect interpersonal relationships. This is similar to a study by Zhao et al. (2019); this study shows that the use of technology for academic purposes does not adversely affect social skills. The purpose and duration of digital interactions determine whether they positively or negatively impact personal relationships.

The findings of this study suggest a clear distinction between the purpose of technology use and its impact on personal relationship. Digital engagement for educational purposes appears to be socially neutral and does not hinder a student's ability to connect with others, the same cannot be said for recreational immersion. The observed decline in interpersonal engagement linked to increased gaming and excessive social media use likely stems from the displacement effect, where solitary virtual achievements and passive scrolling replace the nuanced, real-time emotional labour required for face-to-face relationships. Educational tools act as a bridge to knowledge, excessive leisure-based digital consumption may act as a wall offering a curated or simulated social experience that fails to replicate the depth, empathy, and spontaneous connection found in physical human interaction. Therefore, the challenge for students lies not in the devices themselves, but in finding a balance that prevents digital entertainment from eclipsing the essential human need for genuine presence.

Educational Implication

- Since excessive use of social media and gaming has a detrimental effect on interpersonal relationships, 'Digital Well-being' can be included as an important subject in the school curriculum. Students may be given a clear awareness about when, how and to what extent technology should be used.

- The finding that digital use for educational purposes does not affect interpersonal relationships is very important. Therefore, students can be encouraged to use digital platforms for assignments, research, etc. This will help them shift their focus from entertainment to academic excellence.
- Instead of digital games and social media, group discussions, role plays and sports can be increased in schools. This will help in developing skills like empathy, leadership and teamwork in students.
- Parents may be empowered to monitor the time their children spend on digital devices at home. Parents can be especially made aware to provide emotional support and proper guidance to children who use social media or games for more than 3 hours.
- Children who are overly immersed in the digital world are likely to experience social isolation. It is essential to identify such students and provide them with the best possible interventions with the help of school counselors.
- Following a hybrid model that gives equal importance to traditional classroom methods while maintaining the benefits of technology will help in the holistic development of students.

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