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## Digital Intelligence and certain Non-Cognitive Intelligences among the Vulnerable Adolescent Students: A Correlational Study

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### Abstract

This study investigates the relationships between digital intelligence and various forms of non-cognitive intelligences among vulnerable adolescent students. Purposive sampling technique and normative survey design was adopted to carry out the study. Employing Pearson correlation coefficients, significant positive correlations were identified between digital intelligence and emotional, social, cultural, and general non-cognitive intelligences. Each correlation was analysed within a sample of 240 students, revealing statistically significant moderate to strong positive relationships, suggesting that as students' digital intelligence increases, so do their other forms of intelligence. These findings highlight the intertwined nature of these intelligences in the digital era and underscore the importance of integrated educational strategies that foster a comprehensive developmental approach in enhancing both digital and non-cognitive skills. The implications of these results are particularly significant for educational practices and interventions aimed at vulnerable adolescent populations, suggesting that boosting one type of intelligence can positively affect others, thereby providing a more holistic educational benefit.

**Keywords**

Digital Intelligence, Non-Cognitive Intelligences, Emotional Intelligence, Social Intelligence, Cultural Intelligence, Vulnerable Adolescents, Integrated Learning.

**Introduction**

The world of education is rapidly changing, and digitization is playing a major role in this transformation. Digitization in education refers to the integration of digital technologies into everyday learning, such as online courses, virtual classrooms, and digital textbooks. This shift towards digital learning has been made possible by advances in technology that have enabled educators to provide tailored learning plans and curricula to their students. As the effect of technology in every aspect of society is seen, the results of digitalization in working life and education have been inevitable. Digitalization is the integration of digital technologies into everyday life by the digitization of everything that can be digitized.

**Need and significance of the study**

Integration of digital technologies and tools into educational practices, including online learning platforms, digital textbooks, educational apps, virtual classrooms, and multimedia resources has become an essential part of education today. The online safety of students and teachers is essential in education in a digital world. Digital intelligence (DQ) encompasses a range of skills and competencies required to thrive in today's digitally-driven world. DQ involves not only technical proficiency with digital tools and platforms but also the capacity to critically evaluate information, communicate effectively online, and adapt to rapidly evolving digital technologies. It plays a crucial role in modern education by equipping students, teachers, and institutions with the knowledge, skills, and mindset needed to Navigate and thrive in today's digital landscape. An individual's ability to effectively navigate and utilize digital technologies in various aspects of life is a function of his/her psychological makeup, especially his cognitive and non-cognitive ability factors. Effect of one's cognitive abilities like intelligence, aptitude, creativity etc. on his/her success in any sphere of activity is somewhat direct. Noncognitive intelligence plays a crucial role in various aspects of life, including personal relationships, career success, mental health, and overall well-being. While cognitive abilities are important, non-cognitive skills are increasingly recognized as essential for navigating and adapting to the rapidly evolving digital world. Personality traits related to risk-taking behavior can impact how individuals approach digital technologies (Aboujaoude, 2017). Some people may be more willing to experiment with new apps, share personal information online, or try out innovative digital solutions, while

others may be more cautious and prefer to stick with familiar platforms and established practices (Seibert, Godulla & Wolf, 2021). It is evident from the forgoing discussion that psychological factors other than cognitive abilities can influence one's digital intelligence. The relationship between these non-cognitive ability factors and digital intelligence is complex and multifaceted, with many socio-cultural factors contributing to an individual's proficiency in navigating the digital world. Research is in its beginning in the area of digital intelligence, and research attempts to understand how non- cognitive intelligences influence digital intelligence is still very sparse. In this context, this investigator intends to make a modest attempt to explore the effect of few selected non- cognitive intelligences like emotional intelligence, social intelligence and cultural intelligence on digital intelligence of secondary school students by selected sample from Coimbatore district, the most industrialized district of Tamil Nadu

### **Statement of the problem**

Digitalization of education necessitates learners to acquire new set of skills and abilities called digital intelligence to adjust themselves effectively with digital world so as to meet the educational needs safely and effectively. Digital intelligence enables the students to effectively navigate, evaluate, and utilize digital technologies and information. The digital intelligence of students is affected by many cognitive and non-cognitive ability factors. Knowledge on such factors that exert influence on digital intelligence of learners will enable the teachers to regulate learner behavior on digital platform. Research on non-cognitive factors that are likely to influence the digital intelligence of learners are in its infancy. The present study is expected to provide scientific evidences to fill some of the existing gaps in the literature.

### **Research Questions**

1. Are the vulnerable adolescent students digital intelligent?
2. Is there any relationship between digital intelligence and non-cognitive intelligences among vulnerable adolescent students?
3. Is it possible to construct an interview schedule to check the digital knowledge and safety of the vulnerable adolescent students?

## Objectives of the study

The main thrust of the investigation is to examine the following objectives:

1. To determine the relationship between digital intelligence and certain non-cognitive intelligence among the vulnerable adolescent students of Coimbatore District
2. To determine the relationship between digital intelligence and cultural intelligence among vulnerable adolescent students of Coimbatore District
3. To determine the relationship between digital intelligence and emotional intelligence among vulnerable adolescent students of Coimbatore District
4. To determine the relationship between digital intelligence and social intelligence among vulnerable adolescent students of Coimbatore district

## Variable of the study

Variables are essential components of investigation that allow for the collection and analysis of data. A variable means any characteristic or quantity that can take two or more values. Depending on the nature of research design adopted, variables may be controlled or manipulated.

The study is designed with:

- Digital Intelligence as **Dependent Variable**
- Non-Cognitive Intelligence (Emotional Intelligence, Social Intelligence and Cultural Intelligence) as **Independent Variables**

## Hypotheses

1. To determine the relationship between digital intelligence and certain non-cognitive intelligence among the vulnerable adolescent students of Coimbatore District
2. To determine the relationship between digital intelligence and cultural intelligence among vulnerable adolescent students of Coimbatore District
3. To determine the relationship between digital intelligence and emotional intelligence among vulnerable adolescent students of Coimbatore District
4. To determine the relationship between digital intelligence and social intelligence among vulnerable adolescent students of Coimbatore district

## Research methodology

A normative survey method was adopted for the study. The target population of the study constitutes the vulnerable adolescent students of Coimbatore District. Sample is a portion of the population which is selected for the investigation. The sample for the study was selected through non-probability sampling technique – purposive sampling. The size of the sample for the present study is 240 vulnerable adolescent students. Data were collected from the sample using four tools namely, Digital Intelligence Scale, Cultural Intelligence Scale, Emotional Intelligence Scale and Social Intelligence Scale. Formal permission was obtained from the concerned authorities to administer the tools among the students. The students were given clear instruction about the tools and items in the tools were explained clearly before they give responses. Digital Intelligence Scale and Cultural Intelligence Scale were constructed by the researcher and the reliability was measured through Cronbach's alpha coefficient test from which the values are obtained as 0.70 and 0.71 respectively. Emotional Intelligence Scale and Social Intelligence Scale were adopted tools. The data collected were analyzed from Pearson's Correlation Coefficient method.

### Major finding for the study Hypothesis (H<sub>0</sub>):

**H<sub>0</sub>1:** There is no significant relationship between digital intelligence and non-cognitive intelligence of vulnerable adolescent students

**H<sub>0</sub>2:** There is no significant relationship between digital intelligence and cultural intelligence of vulnerable adolescent students

**H<sub>0</sub>3:** There is no significant relationship between digital intelligence and emotional intelligence of vulnerable adolescent students

**H<sub>0</sub>4:** There is no significant relationship between digital intelligence and social intelligence of vulnerable adolescent students

**Table 1: Correlation coefficient of dependent and independent variables**

Hypotheses	Variables	r-value	p-value
H <sub>o1</sub>	Digital Intelligence and Non-cognitive intelligence	0.8546*	0.00001
H <sub>o2</sub>	Digital Intelligence and Cultural Intelligence	0.7807*	0.00001
H <sub>o3</sub>	Digital Intelligence and Emotional Intelligence	0.6906*	0.00001
H <sub>o4</sub>	Digital Intelligence and Social Intelligence	0.7813*	0.00001

\*Significant at 0.05 level

**H<sub>o1</sub>:** The results from the correlation table 1 demonstrate a significant statistical analysis concerning the relationship between digital intelligence and non-cognitive intelligence among vulnerable adolescent students. Utilizing Pearson's correlation coefficient, the analysis quantifies the degree of linear association between digital intelligence and non-cognitive intelligence.

The Pearson Correlation between digital intelligence and non-cognitive intelligence is reported as 0.8546. This high value signifies a strong positive correlation, suggesting that an increase in one variable is associated with a corresponding increase in the other. In this case, as digital intelligence levels rise, non-cognitive intelligence levels also tend to increase among the students studied.

The significance level, reported as 0.00001, indicates the p-value of the correlation. This value is significantly lower than the commonly accepted threshold of 0.05 indicating a very low probability that such a strong correlation would occur by chance, assuming there is no actual correlation in the population. Therefore, the likelihood of observing this correlation due to random variation is nil.

These findings compellingly reject the null hypothesis, which posited no significant relationship between digital intelligence and non-cognitive intelligence among these students. Instead, the evidence robustly supports the alternative hypothesis of a significant positive relationship. This insight suggests that



educational strategies that enhance one type of intelligence may positively influence the other, thereby offering valuable implications for educational practices and support mechanisms targeting this demographic.

**H<sub>02</sub>:** The statistical analysis provided examines the correlation between digital intelligence and cultural intelligence among vulnerable adolescent students, to determine the strength and direction of the linear relationship between these variables.

The Pearson Correlation coefficient between digital intelligence and cultural intelligence is reported as 0.7807. This value indicates a strong positive correlation, suggesting that increases in one of these intelligences are likely associated with increases in the other. Specifically, students with higher levels of digital intelligence also tend to exhibit higher levels of cultural intelligence.

The significance level, marked as 0.00001 reflects the p-value. The sample size for this analysis is 240 for both variables, providing a robust data set that lends significant reliability to the statistical conclusions. The marked significance at this stringent level confirms that the correlation is not only statistically significant but also practically meaningful.

**H<sub>03</sub>:** The correlation analysis examining the relationship between digital intelligence and emotional intelligence among vulnerable adolescent students reveals significant findings. According to the Pearson correlation coefficient, there is a moderate positive correlation of 0.6906 between these two variables. This indicates that as digital intelligence increases, there is a corresponding increase in emotional intelligence, although the relationship is less strong than with other types of intelligence such as cultural or non-cognitive intelligence.

The significance level for this correlation, indicated by a two-tailed p-value of 0.00001, is well below the conventional thresholds of 0.05. This statistically significant result strongly suggests that the observed moderate correlation is not due to random chance, but rather indicates a real association between digital and emotional intelligence in this group of students. The robustness of these findings is supported by the substantial sample size of 240 for both digital and emotional intelligence variables. This ensures a high level of reliability and validity in the statistical analysis performed. The significant result at this stringent level confirms not only the statistical significance of the findings but also their practical relevance.

Consequently, these results decisively refute the null hypothesis that posited no significant relationship between digital intelligence and emotional intelligence among vulnerable adolescent students. Instead, the evidence points to a significant, although moderate, positive relationship. This suggests that initiatives aimed at boosting digital intelligence could have a beneficial impact on emotional intelligence, proposing a multifaceted approach to educational interventions that cater to enhancing both aspects of intelligence in this demographic. This integrated strategy could prove especially advantageous in addressing the unique challenges and needs of these students.

**H<sub>04</sub>:** The correlation analysis concerning the relationship between digital intelligence and social intelligence among vulnerable adolescent students shows notable outcomes. The Pearson correlation coefficient between these two variables is reported as 0.7813, indicating a strong positive correlation. This suggests that increases in digital intelligence are associated with corresponding increases in social intelligence. This moderate to strong correlation implies that as students enhance their digital skills and understanding, their social intelligence—defined as the ability to navigate and manage social interactions effectively—also tends to improve.

The significance of this correlation is affirmed by a p-value of 0.00001. This p-value is significantly below the conventional thresholds of 0.05, strongly suggesting that the correlation observed is not due to random chance. The probability that such a correlation would occur by chance, assuming the null hypothesis that there is no actual correlation in the population, is extremely low, thereby lending credence to the validity of the results.

With a sample size of 240 for both digital and social intelligence variables, the study benefits from a robust dataset that enhances the reliability and generalizability of the findings. A large sample size like this ensures that the results are statistically sound and reflective of the broader population traits being studied. The significance at this stringent level further underscores the practical importance of the correlation.



**DISCUSSIONS BASED ON MAJOR FINDINGS**

1. There is significant relationship between the digital intelligence and non-cognitive intelligence of vulnerable adolescent students. A correlation value close to 1 signifies that digital intelligence and non-cognitive intelligence are closely related. This implies that individuals who have higher digital intelligence - the ability to effectively use digital tools and technology are likely to also exhibit higher non-cognitive intelligence - like emotional regulation, adaptability, motivation, and interpersonal skills. Digital intelligence includes the ability to understand and use digital tools and technology effectively. Its high correlation with non-cognitive intelligence indicates that individuals with higher digital intelligence are likely to excel in non-cognitive areas such as emotional intelligence, social skills, adaptability, and self-control. Non-cognitive intelligence refers to traits and skills that influence personal and professional success beyond cognitive abilities. The strong correlation suggests that individuals who are intelligent, adaptable, and self-motivated under non-cognitive aspects might be more adept at learning and using digital tools.
2. The correlation of 0.7807 indicates a strong positive association. This means that as digital intelligence increases, cultural intelligence tends to increase as well. Digital intelligence refers to the ability to effectively understand and navigate digital environments. This includes technical skills, online communication skills, and the capacity to solve problems using digital tools. Cultural intelligence is the ability to understand, respect, and work effectively in diverse cultural contexts. It involves knowledge of different cultures, awareness of cultural differences, adaptability, and social sensitivity in multicultural settings. People with high digital intelligence can adapt well to changing environments. This is a skill which is essential for cultural intelligence. This adaptability across various platforms and technologies might also help individuals navigate cultural differences more effectively. Both digital and cultural intelligence involve a strong emphasis on communication skills. Understanding how to communicate across digital platforms often requires cultural sensitivity, especially in global or cross-cultural contexts. As businesses and communities become increasingly global and connected through digital platforms, cultural and digital intelligence become intertwined. This correlation suggests that individuals who are proficient in digital tools may also possess or develop the cultural sensitivity necessary to thrive in international and multicultural digital environments. Hence, Programs that target the development of digital skills could also emphasize the importance of cultural awareness and

competence, as these areas are likely to reinforce each other. Moreover, individuals who are proficient in digital environments are likely to exhibit a high degree of cultural sensitivity, which is essential for thriving in cross-cultural and digitally connected settings.

3. A correlation value of 0.6906 between digital intelligence and emotional intelligence indicates a moderate positive relationship. This value indicates that individuals who are higher in digital intelligence are likely to have better emotional intelligence. Emotional intelligence is the ability to perceive, understand, manage, and regulate one's emotions, as well as to empathize and interact effectively with others. Key components of emotional intelligence include self-awareness, self-regulation, empathy, motivation, and social skills. Digital intelligence often involves communicating through digital platforms via emails, social media, and collaborative tools. Emotional intelligence plays a key role in interpreting the tone, managing responses, and understanding the emotional context of online interactions, which often lack non-verbal cues. Individuals with higher emotional intelligence may have better control over their online behaviors, such as managing screen time, avoiding impulsive responses in digital communication, and maintaining a balance between digital and offline life. This self-regulation aspect supports digital well-being, a component of digital intelligence. This finding highlights the importance of both skill sets in fostering effective digital interactions and maintaining emotional well-being in the digital age.
4. A correlation value of 0.7813 between digital intelligence and social intelligence highlights the strong interconnection between these two skill sets. Individuals who are adept at managing social relationships and interpreting social dynamics in physical settings tend to exhibit similar capabilities in digital environments. This finding underscores the growing importance of developing both digital and social intelligence to thrive in increasingly connected and digitally mediated social spaces. Digital intelligence often requires interacting with others through various platforms (e.g., social media, emails, messaging apps). Individuals with high social intelligence are likely better at interpreting the social cues within these digital communications, fostering more effective and harmonious online interactions. The correlation suggests that those who are socially intelligent can adapt their relationship-building skills to digital environments, using digital tools to foster meaningful connections. Both digital and social intelligence are essential in collaborative work environments, especially in virtual teams. Socially intelligent individuals use their interpersonal skills to work harmoniously in digital contexts, improving teamwork, cooperation, and problem-

solving in remote or online settings. In remote work or virtual team settings, those with high social intelligence may leverage their skills to navigate team dynamics, manage conflicts, and foster cooperation in online collaboration. Educational institutions can integrate digital and social intelligence development in their curricula.

The overall impression of the findings is the programs aimed at improving digital intelligence may also enhance non-cognitive skills, and vice versa. This interconnected development could be leveraged in educational curricula to foster both technical and soft skills simultaneously.

### **Implications of the study**

- This study creates awareness among students to identify their online safety risks.
- This study enables teachers to promote healthy digital habits.
- This study is useful to enhance student's learning outcomes.
- This study assesses student learning outcomes in digital contexts
- This study enables teachers to foster a supportive learning environment.
- This study is useful to balance the screen time and physical activity.

This study is useful to enhance student's critical thinking and media literacy

### **Suggestions for further research**

By observing the findings and limitations of the present study, the following suggestions are given which can be considered for the future research.

- Research shall be conducted on the mixed-methods approaches for Digital Intelligence.
- Research can be conducted in investigating digital intelligence in emerging technologies.
- Academic achievements of students after using wearable technology and bio-data in digital intelligence.
- Research can be conducted in investigating the impact of digital intelligence on academic achievements.

- This study shall be conducted in different geographical area so that the findings of the present study can be compared with other regions.
- This study shall be conducted by considering more or different intervening variables into account.
- The study shall be conducted for identifying other non-cognitive intelligences.

## Conclusion

The study conclusively demonstrates that non-cognitive intelligences significantly influence digital intelligence among vulnerable adolescent students. Emotional, social, and cultural intelligences each uniquely contribute to digital navigation capabilities. This suggests that educational strategies should not only focus on developing technical skills but also on enhancing non-cognitive abilities that support digital engagement. The findings advocate for a holistic approach to digital education, emphasizing the importance of a supportive learning environment that fosters both cognitive and non-cognitive skills. This can potentially enhance students' learning outcomes and prepare them better for the digital world. Further research is suggested to explore these relationships across different demographics and with additional intervening variables to broaden the understanding of digital intelligence in education.

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